Chapter 8
Brochures & PDS

A Revolutionary Way to Extend the Service Life of Concrete Structures. Simple...Sure...Safe.

Cortec's patented MCI® (Migrating Corrosion Inhibitors) technology protects reinforcing metal in concrete from corrosion. MCIs rehabilitate existing concrete structures and extend the life span of new structures. Often, corroding rebar in deteriorating concrete is the cause of costly repairs, financial losses, injuries and deaths, but Cortec® has the corrosion solution. Cortec® MCI® products for concrete maintain structural integrity, rehabilitate vulnerable structures, and alleviate environmental concerns. A unique feature of MCI® is that the inhibitor will migrate a considerable distance through concrete to protect embedded ferrous metals.

Causes of Corrosion:

Reinforcement in new concrete is generally protected from corrosion due to the high alkaline nature of the concrete itself. The high pH of the concrete (usually greater than 12.5) causes a passive oxide film to form on the steel. Environmental factors can affect this protective oxide film and induce the formation of corrosion cells. Once corrosion starts, some parts of the reinforcement become anodic, discharging iron ions (current) into the electric cell. Steel areas that receive this current are the cathodic areas of the corrosion cell. This is where hydroxide ions are formed. Iron and hydroxide ions react to form iron hydroxide, FeOH, which further oxidizes to form rust. Once started, the rate of corrosion is affected by the concrete's electrical resistivity, moisture content, and the rate at which oxygen migrates through the concrete to the steel. As rust formation continues, it can take up to four times the volume originally occupied by the embedded reinforcement, causing cracking and spalling of the concrete.

Chlorides:

Chloride ions can penetrate the passive oxide film on the reinforcement. They combine with iron ions to form a soluble iron chloride complex that carries the iron into the concrete for later oxidation (rust). Once chlorides reach a level of about 0.15% (water soluble chloride by mass of cement) in the concrete, corrosion starts. Concrete can be exposed to chlorides from several different sources, including chloride containing set accelerators, deicing salts, seawater, and airborne salts.

Carbonation:

Carbonation is the process by which carbon dioxide in the air reacts with hydroxides in the concrete such as calcium hydroxide, to form carbonates. This reaction significantly lowers the pH. When the pH of concrete surrounding embedded reinforcing steel drops below 12, the protective oxide layer is lost, and the corrosion process begins.

Acid Rain/Industrial Pollutants:

Acids attack concrete by dissolving the cement paste and calcareous aggregates. They also reduce the pH of the concrete, allowing the corrosion process to begin. Pollutants such as sulfate attack the concrete by reacting with hydrated compounds in the hardened cement paste. These reactions can lead to disintegration of the concrete, making embedded reinforcement more susceptible to corrosive attack.

Once a concrete structure is built, it's impossible to coat the reinforcing steel with fusion-bonded epoxy to protect it from corrosion. Cathodic protection is ineffective unless the steel reinforcement is electrically continuous.

Cortec® MCI®, however, can be easily added to new concrete or used for rehabilitation and will not delay construction or increase construction costs other than the small cost of the material. Unlike standard inorganic inhibitors, Cortec® MCIs do not have to come in contact with the reinforcing steel upon application because they can migrate to the steel and protect it.

When specified in new construction, Cortec's MCI® line of concrete admixtures offers reinforcing steel superior corrosion protection against carbonation and chloride attack.

Comparison of Cortec® MCI® Admixtures to Other Inhibitors:

Feature	Cortec® MCI® Inhibitor	Calcium Nitrite:
Environmentally friendly, derived from renewable resources	True	False
Used in small quantities—less than 1.5 pints/yd3 (1 liter/m3)	True	False
Required dosage rate is not affected by expected chloride exposure	True	False
Ability to migrate through concrete in a vapor phases at ambient temperatures	True	False
Does not increase shrinkage compared to a control	True	False
Does not require adjustments to concrete mix design (chemical or water)	True	False
Does not affect concrete resistivity	True	False
Does not accelerate concrete set time	True	False
Has UL approval to meet NSF Standard 61 (contact w/potable water)	True	False
Spills can be flushed with large quantities of water down drain	True	False

Summary of Data Involving Cortec® MCI® 2005 NS in Concrete

	Control	MCI® 2005 NS
Air Content (AEC)*	6.2%	6.3%
(NEAC)	2.7%	2.5%
Std. Dev.	1.8	2.4
Compressive Strength (psi) 6 x 12 inch cylinders		
@7 days (AEC)	3550	3630
(NAEC)	3610	4180
@28 days (AEC)	4760	5030
(NAEC)	5180	6120
Flexural Strength, psi, ASTMC192, C78		
@7 days (AEC)	610	610
(NAEC)	720	720
@28 days (AEC)	720	720
(NAEC)	820	820
Setting Time, ASTM C403		
Setting Time, Hour: Minutes		
Initial (AEC)	3:28	3:37
(NEAC)	3:35	3:35
Final (AEC)	4:55	5:07
(NEAC)	4:58	4:55
Slump (AEC)	3 1/3”	3 1/4”
(NEAC)	3 1/4”	3”
Freeze Thaw, ASTM C666, Method A		100%
Relative Durability		

*AEC = air entrained concrete
NAEC = non-air entrained concrete

How Does MCI® Technology Work?

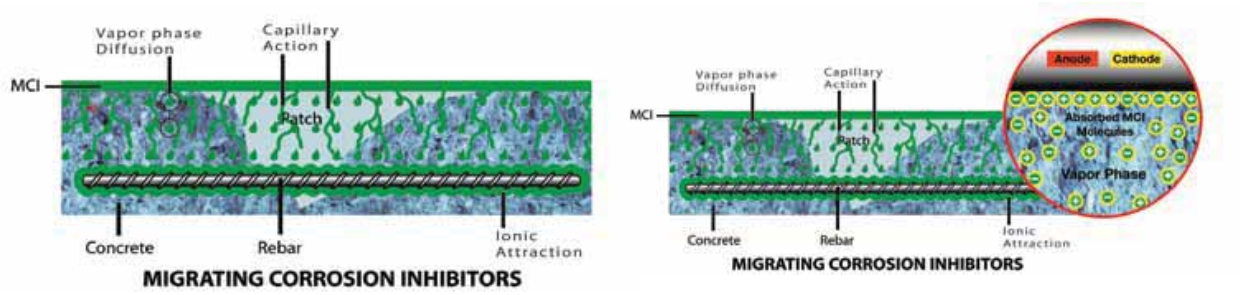
The corrosive effects of carbonation and chlorides cause a breakdown of the natural passivating layer on steel in concrete. MCI's provide protection because of their ability to migrate to the depth of the metal, and form a protective, molecular layer on steel when they come into contact with it.

1. MCI® move as a liquid into the concrete matrix. In new construction, MCI® is admixed either with the batch water or directly into a mixer. For existing structures, MCI applied to the surface is drawn into the concrete via capillary action—the concrete acts like a sponge, drawing MCI inside.

2. MCI® move in a vapor phase throughout the concrete pore structure. This movement is governed by Fick's Law, meaning molecules move randomly throughout the matrix from areas of high concentration to areas of low concentration.

3. When MCI® comes into contact with steel, it has an ionic attraction to it, and forms it's protective, molecular layer. MCI's affinity to the metal is stronger than water, chlorides and other corrosive contaminants.

4. Independent testing has confirmed that MCI can adsorb onto metal to a depth of 75-85 nm, forming a layer that is between 20 and 100 Å thick. In the same testing, chlorides were shown to penetrate only 60 nm deep. This confirmed the ability of MCI to displace chlorides on the metal surface and provide protection even in their presence.

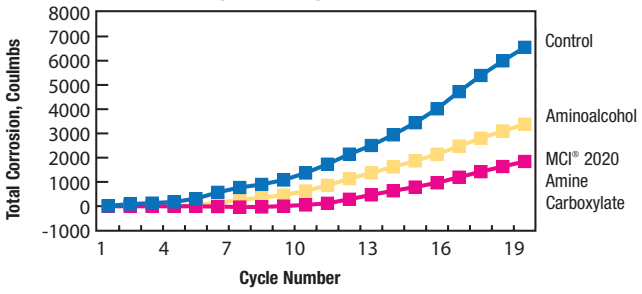


Competitor Comparisons

Time and time again, MCI® products are shown to outperform the competition. Whether using surface applied MCI® 2020 on existing structures to extend the life of a repair or using MCI® 2005 series admixtures to greatly increase the expected service life of a new structure, you can be sure that Cortec® MCI® will provide you with superior corrosion protection.

Cracked Beam Testing of Surface Treatments

Amine Based Products
(3.5% NaCl)

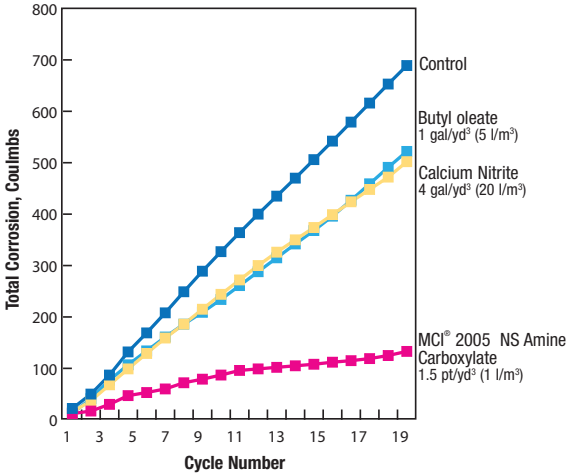


Above: Wiss, Janney, Elstner Associates, Inc. January 1995, WJE No: 922041

Right: American Engineering and Testing August 2003, AET Job No:05-01171

Cracked Beam Testing of Admixtures

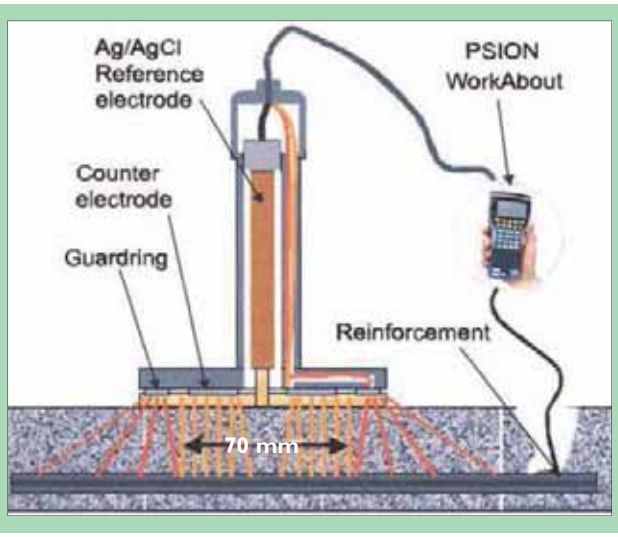
MCI® 2005 NS vs. Competition
(6% NaCl)



Testing of Migrating Corrosion Inhibitors

The effectiveness of Migrating Corrosion Inhibitors can be monitored in many ways. A Quaternary Ammonium Compounds (QAC) test kit is a simple test method to show the presence of our surface applied MCI® in concrete structures. QAC's are a component of the MCI® product chemistry. While this test is not quantitative, it can verify the presence of inhibitor in the structure and can be monitored to show migration of MCI® to the depth of the reinforcement.

Use the manufacturer's instructions for the EM Quant QAC test sticks to analyze each slurry solution/extraction.



Testing the effectiveness of MCI® can be done by monitoring actual corrosion rates of embedded reinforcement. A control reading can be taken, and then subsequent readings can be performed after application of MCI®. This will show what the rate was initially, how low it drops after application of inhibitor, and allow you to determine when you should reapply more inhibitor for additional corrosion protection. There are several different pieces of equipment that use linear polarization to monitor corrosion rates of metallic reinforcement in concrete. These include: Gecor® 6, Gecor® 8, GalvaPulse®, and embedded corrosion rate sensors such as Corrator Probes.


Corrator Probes

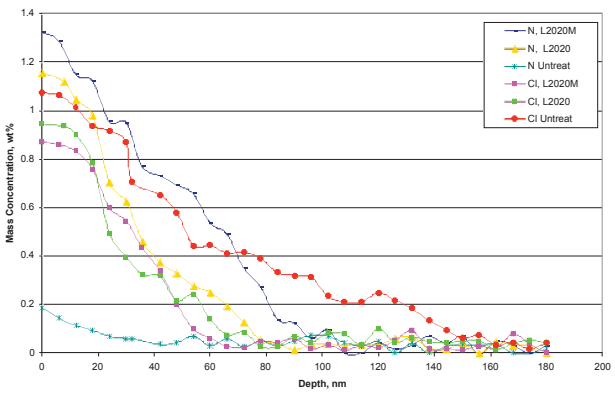

GalvaPulse®


Gecor® 6

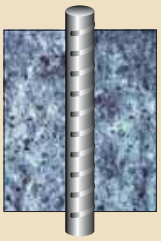
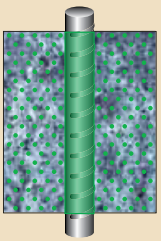
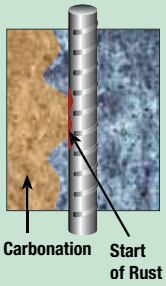
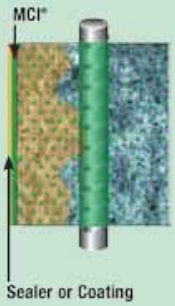
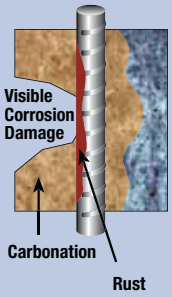
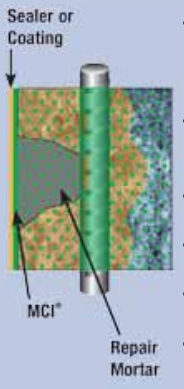
The molecular bond MCI® forms on embedded metals has been verified using X-ray Photoelectron Spectroscopy (XPS) which takes a picture of the metal and can show the depth at which molecules adsorb onto it. This test showed that not only did the MCI® migrate through the concrete, it also adsorbed onto the metal to a deeper depth than chlorides, effectively mitigating corrosion. Contact Cortec® Technical Service if you need more detailed information on testing Migrating Corrosion Inhibitors.


XPS Analysis Machine

XPS Depth Profile (Ar at 4 kV, 15 mA)
Untreated, Inhibitor A and B Concrete Samples after 450 days of testing



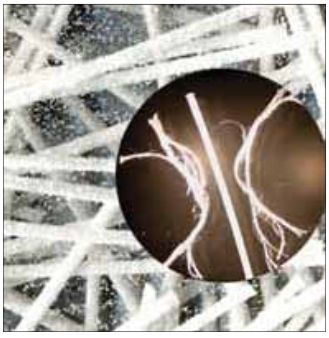
MCI® Product Application Guide

	Condition of Structure	Objectives & Requirements	MCI® Protection	Features and Benefits
STAGE 1 New Concrete	 • Aggressive Environment • Insufficient Concrete Cover	• Extend useful service life • Protect from premature corrosion • Preserve the natural appearance of the concrete	 • 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	• Low Dosage Rate • UL Certified to meet NSF Standard 61 Requirements • No affect on concrete mix design • No affect on concrete properties • Can double the service life of many new structures
STAGE II Existing Structures, No Visible Corrosion Damage	 • Concrete structures without protective coatings • Aggressive environment • Initiation of corrosion • No spalling or cracking	• Slow the rate of corrosion • Protect against possible concrete damage • Protect against further corrosion due to carbonation and/or chloride penetration	 • Application of a MCI® 2020 Series surface applied product by spray, brush or roller • Followed by an application of an anticarbonation coating such as MCI® Architectural Coating OR application of a sealer such as MCI® 2018, 2019, 2021, or 2022	• 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 Series meets NSF Standard 61 requirements
STAGE III Existing Structures, Visible Corrosion Damage	 • Concrete surface with visible corrosion damage (i.e. spalling and cracking), repairs are necessary • High level of chlorides at depth of reinforcement	• 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	 • Cleaning of exposed reinforcement with Cortec's VpCI™ 423, or use of Cortec's VpCI™ CorrVerter® • Application of Cortec's MCI® 2023 grout to exposed reinforcement and repair area • Application of Cortec® MCI® 2039 repair mortar • Application of Cortec® MCI® 2038 Finish repair mortar • Application of Cortec's MCI® 2020 to entire surface area • Application of Cortec® Coating or Sealer	• 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 Series is UL certified to meet NSF Standard 61 requirements

MCI® Grenades

MCI® 2006 NS pre-measured and packaged into water soluble PVA bags.

MCI® Fibers



Polypropylene monofilament, fibers containing MCI® reduce shrinkage cracking of new concrete.

Relevant Case Histories

Construction of Wells Fargo Parking Garage, MCI® 2005 NS (214)

An 1,800 vehicle, six-level parking garage needed all of it's 22,000 cubic yards of concrete to meet or exceed 3,000 psi strength within 18 to 24 hours.

A calcium nitrite based corrosion inhibitor didn't meet the required 24 hour minimum strengths, and also had shrinkage cracking. MCI® 2005 NS met the required specifications, reduced shrinkage by 30%, and eliminated shrinkage cracking even in sub-zero temperatures.

See also:
- China Railroad Bridge, MCI® 2000, 2020, 2021 (092)
- Concrete Bridge Foundation, MCI® 2000, 2020 (119)
- Concrete Railway Bridge, MCI® 2005, 2020, 2023 (139)
- City Street Bridge Deck, MCI® 2000 (211)
- Construction of Parkway Technology Campus, MCI® 2007 Super Corr™, 2022 Sealer (238)

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) on the walls lowered the pH of the concrete causing the corrosion.

The requirements included: a 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 ft^2 of surface hand patch repair and over 1,000,000 ft^2 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:
- China Railroad Bridge, MCI® 2000, 2020, 2021 (092)
- Parking Ramp, MCI® 2020 (121)
- Concrete Railway Bridge, MCI® 2005, 2020, 2023 (139)
- Construction of the World's Largest Mosque, MCI® 2021, MCI® Architectural Coating White (236)
- Inland Steel Building, MCI® 2020 (263)

DePere Waste Water Treatment Tanks MCI® 2020, 2023, 2038 (219)

The outdoor waste water tanks were originally constructed in 1939, and no repairs had been made in almost 20 years. Corroding and spalled areas, as well as exposed rebar had to be repaired.

Concrete was sandblasted and pressure washed. Exposed rebar was coated with MCI® 2023 and spalled areas were repaired with MCI® 2038. This was followed by an application of MCI® 2020 to the entire surface area of the tanks.

Customer was very satisfied with the application and products used. They purchased more products to repair other tanks after the success of this project.

See also:
- HPRS™: High Performance Repair Systems, MCI® 2020, 2023, 2038, 2039, VpCI-386 (150)
- Concrete Spalling Due to Hydrochloric Acid Fumes, MCI® 2020, 2038, CorrVerter® (217)
- Leaking Parking Garage, MCI® 2020, 2022, 2023, 2038 (218)

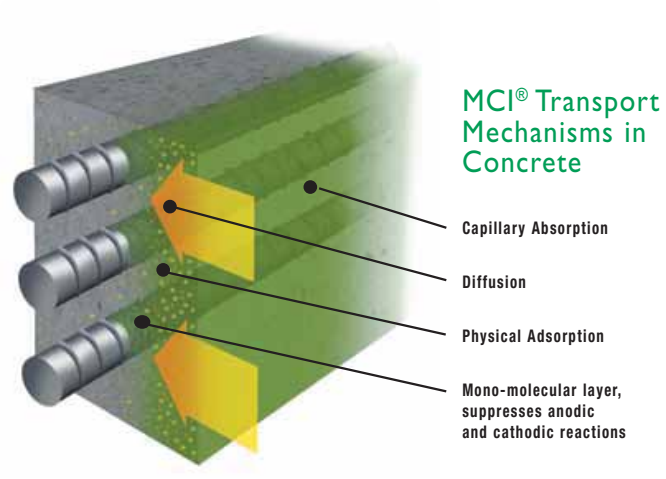
These photos show how the addition of MCI® into seawater protects the rebar from corrosion versus an unprotected control. This is due to the fact that MCI® has a stronger affinity to the rebar, adsorbing deeper into the metal than chlorides and water, effectively mitigating corrosion.

Diffusion Through Concrete

Migrating Corrosion Inhibitors for Reinforced Concrete

B. A. Miksic, FNACE, D. Bjegovic, L . Sipos
(printed in ConChem-Journal, 2/93)

The diffusion rate of MCI® for two different types of concrete was determined using the mix designs (Table 1).Two concrete specimens were placed into a specially designed diffusion cell where they acted as a membrane between two solutions for a 21-day test period (Figure 1). For optimal results, the concentration MCI® was tested at three-day intervals. Every three days, a 15mL aliquot was taken for concentration determination, and after each measurement, the fluid was returned to the cell. An ORION 95-12 Ag/AgCl electrode containing 0.1 M NH_4Cl solution was used for determination of MCI® concentration. Concentration of the inhibitor in the concrete over time was found using electrode potential readouts and a calibration diagram (Figure 2).



MCI® concentration increases with time, showing that the MCI® diffuses through the concrete (Figure 2). Using experimentally obtained data, the coefficient of diffusion was calculated (Figure 3 and Table 2). This data demonstrates the migratory nature of MCIs and proves that they can be used for protection against chloride induced corrosion and carbonation.

General Composition		T-1	T-2
Components	Units		
Concrete	kg/m³	380	380
Water	l/m³	209	171
Aggregate	kg/m³	1720	1823
W/C	%	0.55	0.45
Consistency of Settling	cm	14.5	4.5

Table 1 Composition of Concrete

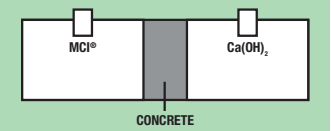


Figure 1 Diffusion Cell

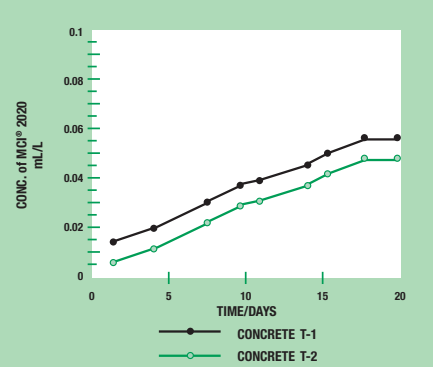


Figure 2 Calibration Diagram

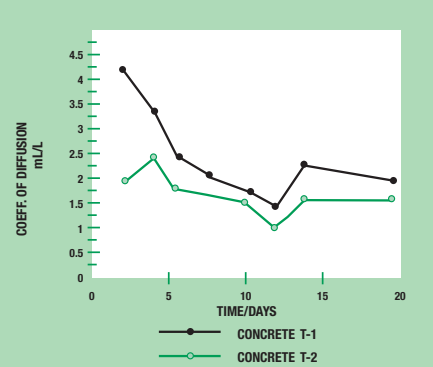


Figure 3 Calibration Diagram

Coefficient of Diffusion cm^2/s^{-1}			
Concrete Sample	Data No.	Middle Value	Standard Deviation
T-1	5	$1.78x10^{-12}$	$0.30x10^{-12}$
T-2	5	$1.45x10^{-12}$	$0.23x10^{-12}$

Table 2 MCI® Coefficient of Diffusion

		Product	Description	Approximate Dosage Rate	Packaging
Admixtures	AminoAlcohol Based	MCI®-2000	Liquid, aminoalcohol 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) and 100 lb (45.4 kg) drums
		MCI®-2002	Microsilica/MCI® 2000 slurry combination.	3-5 pts/yd^3 (1.5-2.5 l/m^3)	5 gal (19 l) pails, 55 gal (208 l) drums
	AminoCarboxylate Based	MCI®-2005	Liquid, amine carboxylate based concrete admixture. Can retard concrete setting time 3-4 hours at 70º F (21º 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. Can not 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 setting time 3-4 hours at 70º F (21º C). Patented.	1 lb/yd^3 (0.6 kg/m^3)	5 lb (2.3 kg) boxes, 50 lb (22.7 kg) and 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) and 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	20 grenades/ carton
		MCI® Metric Grenades®	MCI®-2006 NS powder pre-measured into water soluble bags for admixing into concrete.	1 grenade/ m^3	20 grenades/ carton
		MCI® Mini Grenades®	MCI®-2006 NS powder pre-measured into water soluble bags for admixing into concrete.	1 per 0.5 ft^3 (1 per 0.0015 m^3)	100 grenades/ carton
		MCI® Fiber Grenades®	MCI®-2006 NS powder and MCI® Fibers pre-measured into water soluble bags for admixing into concrete.	2 grenades/ yd^3	20 grenades/ carton
		MCI® Metric Fiber Grenades®	MCI®-2006 NS powder and MCI® Fibers pre-measured into water soluble bags for admixing into concrete.	2 grenades/ m^3	20 grenades/ carton
		MCI® Fibers	Mono-filament polypropylene-based fibers containing Migratory Corrosion Inhibitors (MCI®).	1.5 lbs/yd^3 (910 g per m^3)	5 lb (2.3 kg) boxes, 50 lbs (23 kg) and 100 lbs (45 kg) drums
	Superplasticizers with AminoCarboxylate Based MCI®	MCI®-2007 SuperCorr™	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®-2007 P	Powder, polycarboxylate based superplasticizer with MCI®, which reduces mixing water by 20-30% depending on cement type.	16-27 oz/yd^3 (0.6 - 1.0 kg/m^3)	5 lb (2.3 kg) boxes, 50 lbs (23 kg) and 100 lbs (45 kg) drums
		MCI®-2008 ViaCorr™	Powder, polycarboxylate based superplasticizer for self compacting, self leveling concrete with MCI®.	0.4-0.6% by weight of concrete mix	50 lbs (23 Kg) and 100 lbs (45 Kg) drums
		MCI®-2008 L	Liquid, polycarboxylate based superplasticizer for self compacting, self leveling concrete with MCI®.	0.4-0.6% by weight of concrete mix	5 gal (19 l) pails 55 gal (208 l) drums

		Product	Description	Approximate Dosage Rate	Packaging
Surface Treatments	AminoCarboxylate Based	MCI®-2020	Clear, penetrating surface treatment for existing structures. Contains Migrating Corrosion Inhibitors that form a protective film on embedded metals. Has UL approval to meet NSF Standard 61 Certification for indirect contact with potable water.	150 ft²/gal (3.68 m²/l)	5 gal (19 l) pails 55 gal (208 l) drums
		MCI®-2020 V/O	MCI®-2020 for vertical and overhead applications.	150 ft²/gal (3.68 m²/l)	5 gal (19 l) pails 55 gal (208 l) drums
		MCI®-2020 Powder	Powder version of MCI®-2020. One 100 lb (45.35 kg) drum makes 55 gallons (208 liters) of MCI®-2020 liquid.	150 ft²/gal (3.68 m²/l)	100 lb (45.35 kg) drums
		MCI®-2020 V/O Powder	Powder version of MCI®-2020 V/O. One 100 lb (45.35 kg) drum makes 55 gallons (208 liters) of MCI®-2020 V/O liquid.	150 ft²/gal (3.68 m²/l)	100 lb (45.35 kg) drums
		MCI®-2020 M	New, concentrated version of MCI®-2020 that provides even better corrosion protection. Diluted 1:1 with water to make ready to use product.	150 ft²/gal (3.68 m²/l)	5 gal (19 l) pails 55 gal (208 l) drums
		MCI®-2020 M Ready To Use	New, ready to use version of MCI®-2020 that provides even better corrosion protection.	150 ft²/gal (3.68 m²/l)	5 gal (19 l) pails 55 gal (208 l) drums
		MCI®-2020 M V/O (Ready To Use)	New version of MCI®-2020 V/O with even better corrosion protection.	150 ft²/gal (3.68 m²/l)	5 gal (19 l) pails 55 gal (208 l) drums
	Water Repellants with MCI®	MCI®-2018	100% solids, organosilane sealer containing MCI®. Spray, brush or roller applied.	125-175 ft²/gal (3 -4 m²/l)	5 gal (19 l) pails 55 gal (208 l) drums
		MCI®-2019	Low VOC, solvent based 40% silane sealer containing MCI®. Spray, brush or roller applied.	125-175 ft²/gal (3 - 4 m²/l)	5 gal (19 l) pails 55 gal (208 l) drums
		MCI®-2019 W	Water based, 40% silane sealer containing MCI®. Spray, brush or roller applied.	125-175 ft²/gal (3 - 4 m²/l)	5 gal (19 l) pails 55 gal (208 l) drums
		MCI®-2021	Water based, silicate sealer containing MCI® inhibitor. Spray, brush or roller applied. Patented.	150-250 ft²/gal (3.7-6.1 m²/l)	5 gal (19 l) pails 55 gal (208 l) drums
		MCI®-2022	Water based, silane/siloxane blend sealer containing MCI® inhibitor. Spray, brush or roller applied. Patented.	125-175 ft²/gal (3-4.2 m²/liter)	5 gal (19 l) pails 55 gal (208 l) drums
		MCI®-2022 V/O	Vertical and overhead version of MCI®-2022. Patented.	125-175 ft²/gal (3-4.2 m²/liter)	5 gal (19 l) pails 55 gal (208 l) drums
	Coatings	MCI®- 2026 Primer	Two-component, chemically resistant, water based, epoxy primer for concrete.	250-350 ft²/gal (6.1-8.5 m²/l)	0.75 gal (2.3 l), 6 gal (22.7 l), 15 gal (56.8 l), 165 gal (624.6 l) yield kits.
		MCI®-2026 Floor Coating	Two-component, chemically resistant, 100% solids Novolac epoxy for concrete with excellent chemical and abrasion resistance.	125-150 ft²/gal (3.0-3.7 m²/l)	0.6 gal (2.27 l), 5 gal (19 l), 12.5 gal (47.3 l), 138 gal (522.4 l) yield kits.
		MCI®-2027 Polyurea	Single-component polyurea that is fast drying, UV stable, and has a high gloss finish. Available in clear, grey, tan, and white.	2-3 coats of 10 mils DFT = 112-125 ft²/gal (2.7-3m²/l)	5 gal (19 l) pails 55 gal (208 l) drums.

	Product	Description	Approximate Dosage Rate	Packaging
Specialty Products	VpCI™-422	Water-based rust remover. 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 and bulk.
	VpCI™-432/433	Paint stripper and graffiti remover. Removes paint from concrete without damage. Non-caustic, non-toxic, water cleanable. Also available in gel form.	200-800 ft^2/gal (5-20m^2/l)	5 gal (19 l) pails, 55 gal (208 l) drums, liquid totes and bulk.
	MCI®-2060	Cleaner and degreaser that contains MCI®. It effectively cleans caked on grease, dirt, oil and mud off of 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 containing Migratory Corrosion Inhibitors. Contains microorganisms that break down oils and other petroleum based materials.	Use as concentrate on oil stains, 24-48 oz/gal water for cleaning (188-375 ml/l)	5 gal (19 l) pails, 55 gal (208 l) drums.
	VpCI™-365	Epoxy coating containing VpCI™ that provides optimum corrosion protection to metals outdoors as well as those immersed in fresh and salt water.	~300 ft^2/gal (7.3m^2/l)	Kit containing 5 gal and 2.5 gal pails.
	MCI® Anti-Graffiti Coating	Two -component, solvent based aliphatic urethane for concrete to provide easy removal of graffiti.	516 ft^2/gal at 2 mils DFT (13 m^2/l at 50 microns)	Two 5 gal (19 l) pails (Part A and Part B) per kit.
	MCI® Architectural Coating	Clear, water based, acrylic primer/top coat. Also available in white, gray and custom colors.	535-641 ft^2/gal (13-16 m^2/l)	5 gal (19 l) pails 55 gal (208 l) drums.
	MCI® Coating for Rebar	Water based, 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® Coating for Rebar NT	Non-tacky version of MCI® Coating for Rebar.	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®-2241/2242	Flexible and breathable waterproofing membranes based on a unique combination of acrylic emulsion, Portland cement and fine fibers. MCI®-2241 is a gray color, MCI®-2242 is white.	Each kit covers 88-100 ft^2 when applied at $^1/_{16}$" thickness (8 m^2 per 15.2 l at 1.6 mm)	Each kit yields 4 gallons (15 l). Component A is 2.3 gal (8.9 l) packaged in 5 gal (19 l) pail. Component B is 25 lb (11 kg) bags.
	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 & 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 and bulk.
	MCI® Creteskin™	An industrial strength release agent containing MCI®. This clear protective coating inhibits the adhesion of concrete 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 and bulk.
	MCI®-309	MCI®-309 is a corrosion inhibiting powder for protection of ferrous metals in recessed areas, interior cavities and voids.	0.3-0.5 oz/ft^3 (300-500 g/m^3)	5 lb (2.3 kg) boxes, 50 lb (22.7 kg) and 100 lb (45.4 kg) drums.
	MCI®-2005 Gel	MCI®-2005 in gel format for injection into existing structures.	Based on hole size and number of holes	13 oz (384ml) caulking 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 size and number of holes	13 oz (384ml) tubes, 5 gal (19 l) pails, 55 gal (208 l) drums.
	MCI®-2070	An admixture for asphalt primers used in concrete highway or street asphalt overlays to increase adhesion and effectively inhibit corrosion occurring within the concrete.	Add at a concentration level of 2-4% by weight	5 gal (19 l) pails, 55 gal (208 l) drums
	MCI® Film	A polyethylene film designed for use in the construction industry which inhibits corrosion on both ferrous and nonferrous metals.	n/a	20' x 100' sheeting, 4 mil (6.1 m x 30.48 m, 100 microns)

	Product	Description	Approximate Dosage Rate	Packaging
Repair Products	MCI®-2023	MCI® passivating repair grout for protecting reinforcing steel in concrete. Patent Pending.	60 ft^2 at a thickness of $^1/_{16}$ inch (5.6 m^2 at a 1.6 mm thickness)	Part A 11 lb (5kg) resin, Part B 26.5 lb (12 kg) bag powder. Yields 2.5 gal (9.4 l)
	MCI®-2246	MCI® bonding agent is a unique combination of Portland cement, microsilica, epoxy, and acrylic resin.	70-80 ft^2/gal at 20 mils WFT (1.6-1.8 m^2/l at 0.5 mm)	2 part kit includes 1 gal jug (3.8 l) and 28 lb (13 kg) bag
	MCI®-2038	Two component, fiber reinforced finish repair mortar, with maximum aggregate size of 1.2 mm. Contains MCI®-2006 NS technology.	20.80 ft^2 at $^5/_{16}$" (1.92 m^2 at 8 mm)	55 lb (25 kg) bag of powder and 11.50 lb (5.23 kg) resin. Kit yields 0.56 ft^3 (15.9l)
	MCI®-2039	Two component, fiber reinforced MCI® repair mortar containing MCI®-2006 NS technology.	12 ft^2 per bag at a ½" thick (1.12 m^2 at 12.7 mm).	55 lb (25kg) bag of powder and a 8.3 lbs (3.75 kg) can of resin. Kit yields ~ 3.5 gal (13.4 l)
	MCI®-2311	Single component, full depth repair mortar with MCI®-2006 NS technology.	0.40 ft^3 per 50 lb bag (0.0125 m^3 per 23 kg bag)	50 lb (23 kg) bags
	MCI®-2701	Single component, trowel grade repair mortar with MCI®-2006 NS technology. It is a polymer-modified cement-based mortar for structurally repairing or overlaying deteriorated concrete.	20-25 ft^2 per bag at ¼" thick (2 m^2 at 6 mm).	50 lb bag yields 0.5 ft^2 (27 kg bag yields 0.014 m^2).
	MCI®-2702	Single component, overhead repair mortar with MCI®-2006 NS technology.	20-25 ft^2 per bag at ¼" thick (2 m^2 at 6 mm thick).	50 lb bag yields 0.45 ft^2 (23 kg bag yields 0.013 m^2)

MCI® Questions? Contact:

Jessi Jackson Meyer
V.P. Sales Asia/MCI®/Additives
651 429 1100 ex. 185
jmeyer@cortecvci.com

Josh Hicks
Technical Service Engineer
651 429 1100 ex. 147
jhicks@cortecvci.com

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 THEREWITH. 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.

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

Distributed by:

Revised: 12/12 Supersedes: 09/10

Migrating Corrosion Inhibitors!

MCI® Admixtures

Migrating, corrosion-inhibiting admixtures for reinforced structures.

Increases durability and dramatically reduces corrosion.

CORTEC CORPORATION

Environmentally Safe VpCI®/MCI® Technologies

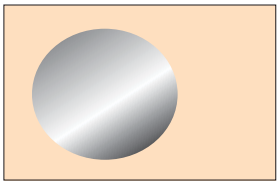
MCI® 2000 Series

Migrating, Corrosion-Inhibiting Admixtures

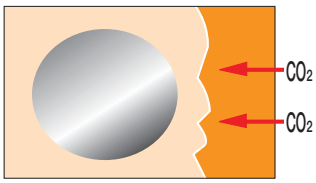
A new reinforced concrete structure is designed to have a long service life – typically in excess of 50 years. Unfortunately, many structures fall short of this goal, requiring expensive repair and protection work in the future.

A major reason for the premature deterioration of our reinforced concrete infrastructure is ***corrosion of the reinforced steel.***

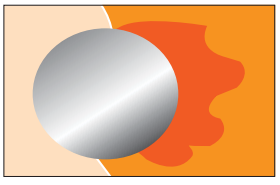
The Two Major Causes Of Corrosion In Concrete



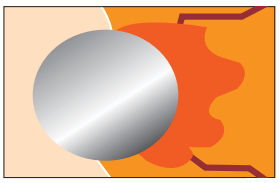
Rebar in alkaline concrete.



Loss of alkalinity with CO_2 ingress.



Corrosion can begin when carbonation reaches the steel.



Cracking and spalling will ultimately occur.

Concrete is a highly alkaline material when first produced (pH range 12-13). The embedded steel is protected by a passive oxide layer which is maintained by high alkalinity at the surface of the steel.

Under certain exposures and conditions the natural passivating protection of the steel breaks down. In the presence of moisture and oxygen, corrosion then occurs.

Carbonation of Concrete

The most common cause of loss of passivating alkalinity is carbonation – a process whereby atmospheric carbon dioxide reacts with the soluble alkaline calcium hydroxide and other cement hydrates in concrete. These are then converted into insoluble calcium carbonate.

$$Ca(OH)_2 + CO_2 \rightarrow CaCO_3\downarrow + H_2O$$

(Soluble) High Alkalinity Lower Alkalinity (Insoluble)

The alkalinity of the cement matrix is reduced and its passivating ability is lost progressively from the surface inward.

Once the concrete in contact with reinforced steel has carbonated, the steel is no longer protected. In the presence of moisture and oxygen, corrosion damage is inevitable.

Chlorides in Concrete

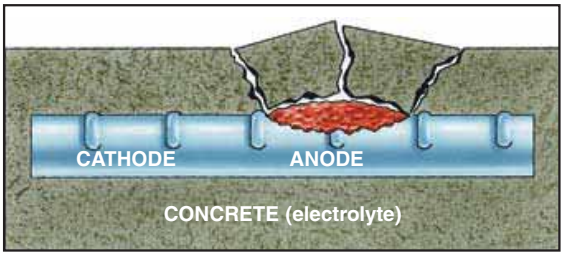
The concentration of chlorides required to promote corrosion of embedded reinforcement is affected by the pH of the concrete. In alkaline fresh concrete a threshold level of about 7,500-8,000 ppm is required to start corrosion, but
if the alkalinity is reduced the chloride threshold is significantly lower (below
100 ppm). Typical sources of chloride include deicing salts, salt water environments and some commercial admixtures.

An Innovation That Fights Corrosion And Extends The Service Life Of Reinforced Concrete Structures

The Electrochemical Process of Corrosion
The corrosion products of steel (iron oxides or hydroxides), occupy a much greater volume than the steel (4-12 times the volume). This increase in volume exerts a great expansive pressure within the concrete, leading to cracking, rust staining and spalling over the corroded reinforcement.

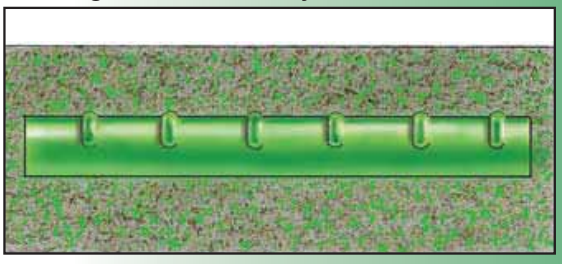
Being an electrochemical process, corrosion of steel in concrete requires an electrolyte. Concrete is full of small pores which contain moisture, and so, is an effective electrolyte. A small, electrical current flows between the anode and the cathode with corrosion activity (rust formation) taking place at the anode.

Unprotected Reinforcing Steel



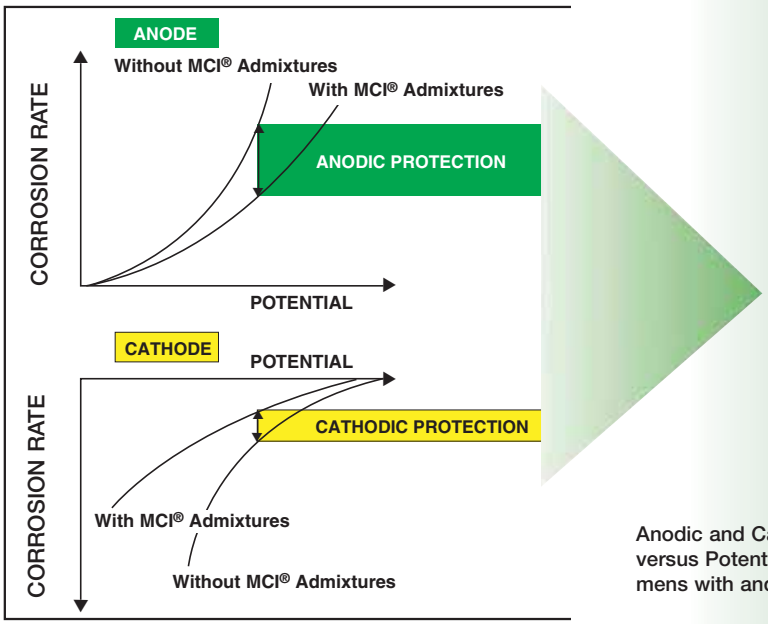
The Corrosion Process Without Cortec® MCI® Admixtures.
At the Cathode
($0_2 + 2H_20 + 4\ e^- \rightarrow 4\ OH^-$)
At the Anode
($Fe \rightarrow Fe^{++} 2e^-$)

Reinforcing Steel Protected By Cortec MCI® Admixtures



When MCI® reaches reinforcing steel, it forms a protective layer (about 20Å thick) that protects the steel in both anodic and cathodic areas.

The Double-Action Performance Of Cortec MCI® 2000 Series Protects At Both The *Anode And Cathode*



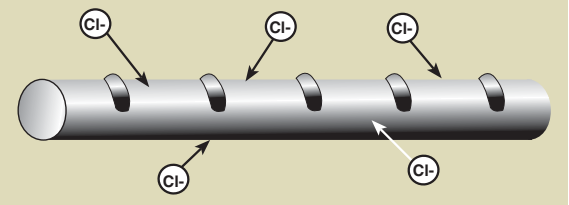
Laboratory tests measure the potential shift at both the anode and cathode.

The combination of these two protective mechanisms leads to dramatic overall reduction in corrosion activity.

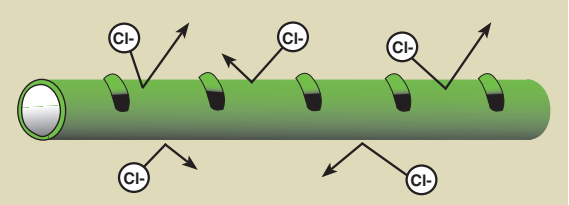
Anodic and Cathodic plots of corrosion rate ($\mu A/cm^2$) versus Potential (mV) of reinforced concrete specimens with and without Cortec® MCI® admixtures.

How does MCI® Technology Work?

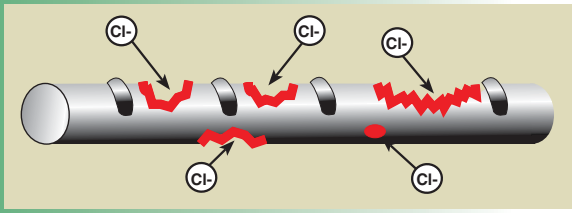
Unprotected Steel



MCI® Protected Steel



Chloride-Induced Corrosion

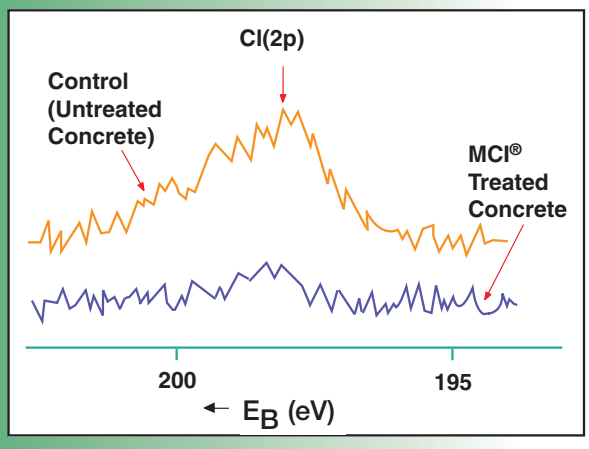


The corrosive effects of carbonation and chlorides cause a breakdown of the natural passivating protection of steel. When MCI® comes in contact with steel it forms a protective layer. This layer has been measured (using X-ray Photoelectron Spectroscopy — XPS) to be between 20 and 100Å thick at the molecular level.

MCI® 2000 Actually Displaces Chloride Ions at the Steel Surface

XPS Surface analysis testing has also proven MCI's ability to displace chloride ions from the surface of steel in chloride environments.

Chloride Part Of XPS Spectrum



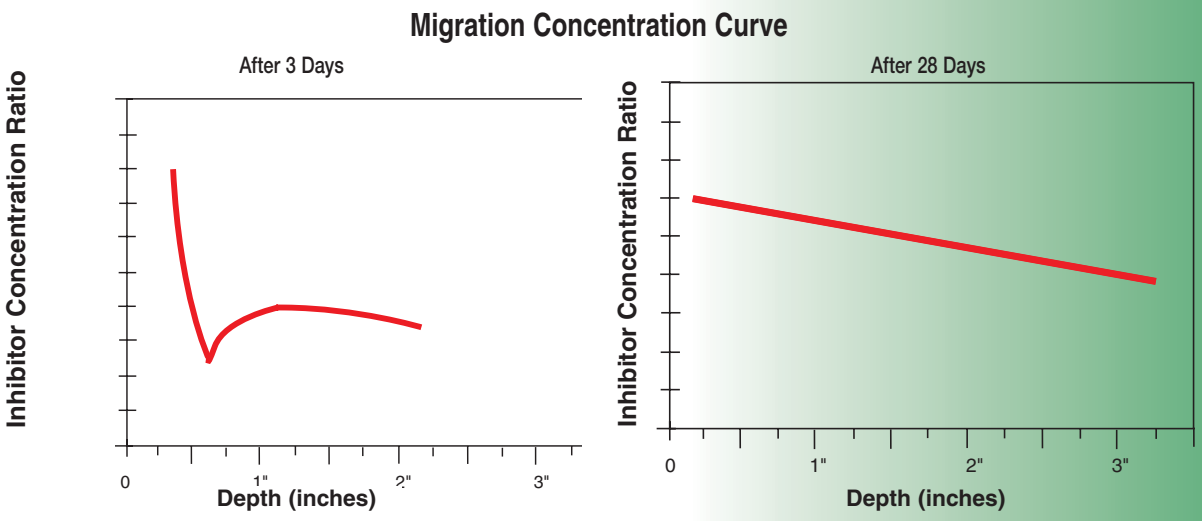
Note the almost complete elimination of chloride at the surface with MCI® treatment.

Immersion In Seawater

Without MCI®-2000 With MCI®-2000

For Durable Concrete Overlays... Migration Of Cortec® MCI® 2000 Series Is Key

MCI® admixtures are unique in their ability to travel or migrate throughout the concrete. This migration occurs via both liquid and vapor diffusion and has been proven in concrete using Secondary Neutron Mass Spectroscopy (SNMS) methods.



The rate of migration is dependent on the density and permeability of the concrete and other factors. The migration of MCI® amounts to a distance of about 7.5 cm within 7 days of initial application. This migration rate is relatively independent of the moisture content of the concrete. As a result, MCI® can also help protect the original embedded rebar in decks receiving partial depth overlays.

Long-Term Corrosion Studies

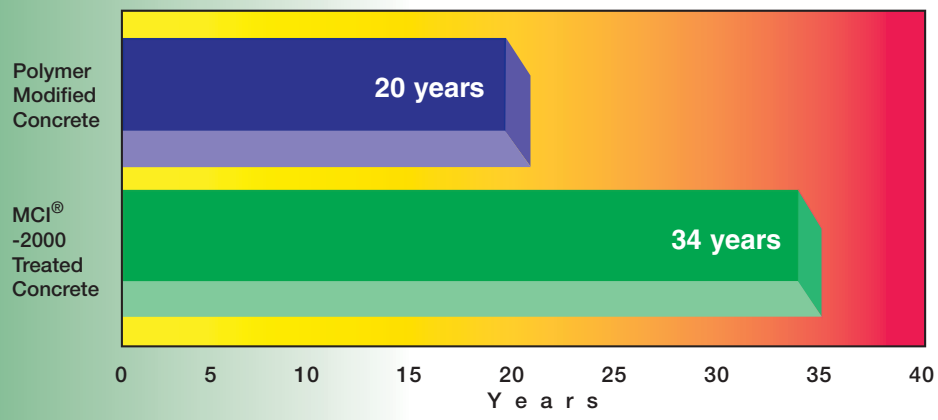
Proven Effective In Long-Term Independent Tests

The chemical structure of MCI® admixtures is such that they do not decompose over an extended period of time, making them effective for periods in excess of 34 years. This effectiveness has been proven in two long-term independent test programs: The Strategic Highway Research Program (SHRP) and Cracked Beam studies based on ASTM G 109.

The SHRP Program

The SHRP Program involved both lab testing and actual field installation on bridges throughout the USA. In comparison to Polymer Modified Concrete Overlays, MCI® treated concrete overlays demonstrated a dramatic extension of predicted service life.

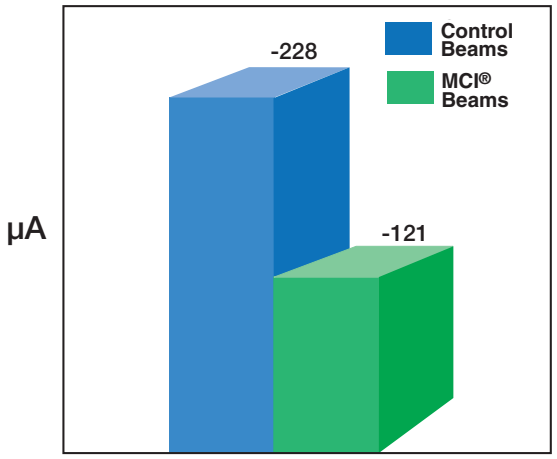
Predicted Service Life of Bridge Decks



Cracked Beam Corrosion Testing

Cracked beam tests are based on ASTM G 109. This is the standard test method for determining the effects of chemical admixtures on the corrosion of embedded steel reinforcement in concrete exposed to chloride environments.

Concrete beams are cast and cracked, some containing MCI® admixtures and others not (control beams). A salt water solution is then ponded and rinsed periodically over a 1-1/2 year period. Corrosion current is measured in microamps and compared.



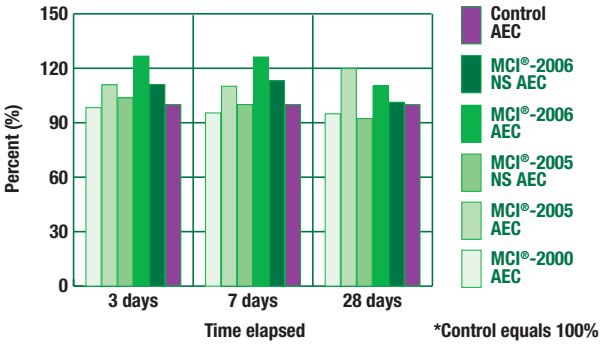
After 1-1/2 years of severe exposure corrosion, activity has significantly decreased over control specimens.

For Producing High Durability Concrete That Resists The Harmful Effects Of Corrosion

MCI® corrosion inhibiting admixtures do not compromise any of the physical properties of concrete at the recommended dosage rates.

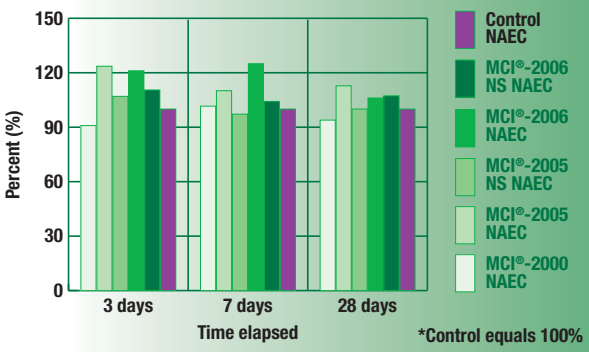
Change in Air Content (%) MCI® Vs. Control	MCI®-2000	MCI®-2005	MCI®-2005 NS	MCI®-2006	MCI®-2006 NS
Air Entrained	0.5	0.2	0	0.2	0
Non-Air Entrained	0.1	0.1	-0.2	0	0.2

Average Flexural Strength, MCI® Compared to Control*
Air Entrained Concrete (AEC)



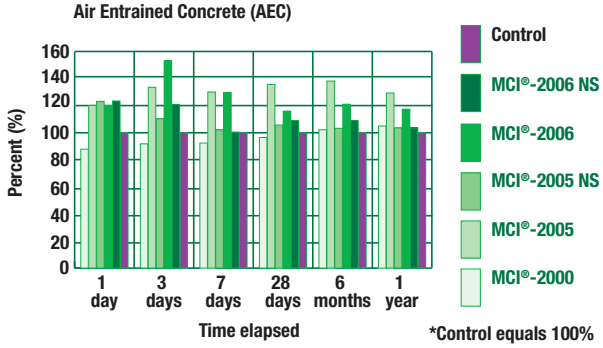
*Control equals 100%

Average Flexural Strength, MCI® Compared to Control*
Non-Air Entrained Concrete (NAEC)



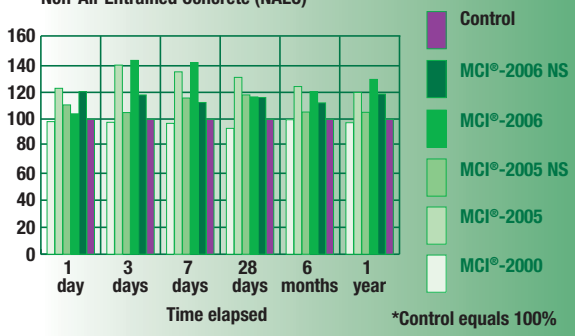
*Control equals 100%

Average Compressive Strength, MCI® Compared to Control*
Air Entrained Concrete (AEC)



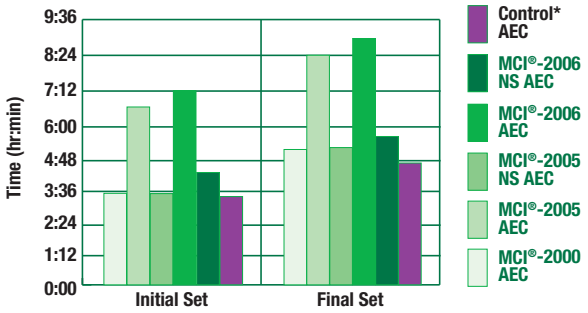
*Control equals 100%

Average Compressive Strength, MCI® Compared to Control*
Non-Air Entrained Concrete (NAEC)



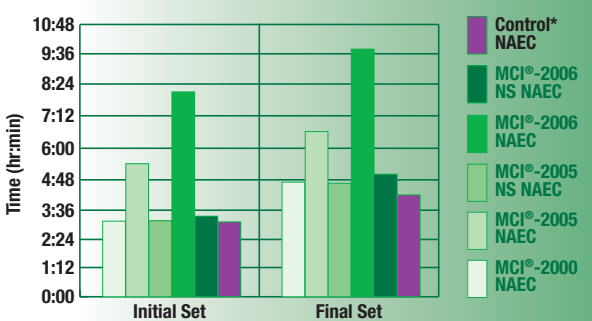
*Control equals 100%

Average Setting Time, MCI® vs. Control*, Air Entrained Concrete
MCI Set Time Vs. Control (Air Entrained Concrete)



*Control is an average of set times from all control test samples.

Average Setting Time, MCI® vs. Control*, Non-Air Entrained Concrete
MCI Set Time Vs. Control (Non-Air Entrained Concrete)



*Control is an average of set times from all control test samples.

Cortec® MCI® Series Dramatically Reduces Corrosion In Concrete Structures. MCI® Protects Your Investment!

	Product	Description	Dosage rate	Packaging	Applications
Aminoalcohol Based	MCI®-2000	Liquid, aminoalcohol based concrete admixture.	1 pt/yd^3 (0.62 l/m^3)	5 gal (19 l) pails, 55 gal (208 l) drums	Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
	MCI®-2001	Powder, fumed silica/MCI®-2000 combination.	3 lb/yd^3 (1.78 kg/m^3)	5 lb (2.3 kg) boxes, 50 lb (22.7 kg) and 100 lb (45.4 kg) drums.	Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
	MCI®-2002	Microsilica/MCI®-2000 slurry combination.	3-5 pts/yd^3 (1.5-2.5 l/m^3)	5 gal (19 l) pails, 55 gal (208 l) drums	Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
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.	1.0 pts/yd^3 (0.6 1/m^3)	5 gal (19 l) pails, 55 gal (208 l) drums	Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
	MCI®-2005 NS	Liquid, normal set version of MCI®-2005. Patented.	1.5 pts/yd^3 (1.0 1/m^3)	5 gal (19 l) pails, 55 gal (208 l) drums	Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
	MCI®-2006	Powder, amine carboxylate based concrete admixture. Can retard 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) and 100 lb (45.4 kg) drums.	Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
	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) and 100 lb (45.4 kg) drums.	Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
	MCI® Grenades	MCI®-2006 NS powder pre-dosed into water soluble bags for admixing into concrete. Patented.	1 grenade/yd^3	20 grenades/carton	Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
	MCI® Metric Grenades	MCI®-2006 NS powder pre-dosed into water soluble bags for admixing into concrete. Patented.	1 grenade/m^3	20 grenades/carton	Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
	MCI® Mini Grenades	MCI®-2006 NS powder pre-dosed into water soluble bags for admixing into mortars. Patented.	1 grenade/0.5 ft^3	100 grenades/carton	Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
Superplasticizers with Amine Carboxylate Based MCI	MCI®-2007	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	Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
	MCI®-2007 P	Powder, polycarboxylate based superplasticizer with MCI®.	3.5-6.0 oz/100 lb (5-9 kg/m^3) by weight of cement	5 lb (2.3 kg) boxes, 50 lb (22.7 kg) and 100 lb (45.4 kg) drums.	For use in self leveling, self compacting concrete mix designs, particularly 'low' or 'no' slump applications. Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
	MCI®-2008 ViaCorr	Powder, polycarboxylate based superplasticizer for self compacting, self leveling concrete with MCI®.	0.4-0.6% by total weight of concrete mix.	5 lb (2.3 kg) boxes, 50 lb (22.7 kg) and 100 lb (45.4 kg) drums.	For use in self leveling, self compacting concrete mix designs, particularly 'low' or 'no' slump applications. Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.
	MCI®-2008 L	Liquid, polycarboxylate based superplasticizer for self compacting, self leveling concrete with MCI®.	0.4-0.6% by total weight of concrete mix.	5 gal (19 l) pails, 55 gal (208 l) drums	For use in self leveling, self compacting concrete mix designs, particularly 'low' or 'no' slump applications. Reinforced concrete structures such as bridges, parking garages, highways, decks and lanais.

Visit our website for more information on MCI®. **www.CortecMCI.com**

Total Corrosion Control

Cortec® Corporation is dedicated to controlling corrosion at ALL STAGES of a product life cycle. Cortec® has developed a diverse range of corrosion protection products including cleaners, metalworking fluids, water- and oil-based coatings and corrosion inhibitors, rust removers, paint strippers, powders, packaging foams, paper, films and surface treatments and admixtures for concrete. Contact Cortec® for additional brochures and information.

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.

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

Distributed by:

Revised: 02/09 Supersedes: 05/08

CORTEC CORPORATION

Environmentally Safe VpCI™/MCI® Technologies

MCI® SURFACE APPLIED CORROSION PROTECTION SYSTEMS for REINFORCED CONCRETE

Unique Migratory Corrosion Inhibitors™

ISO 9001 QUALITY SYSTEM REGISTERED

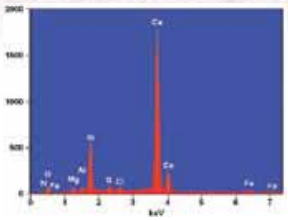
ENVIRONMENTAL ISO 14001 CERTIFIED SYSTEM REGISTERED

Diffusion Through Concrete

The Efficacy of Using Migrating Corrosion Inhibitors (MCI 2020 & MCI 2020 M) for Reinforced Concrete

B. Bavarian, PhD., L. Reiner
March 2004

Untreated	N	O	Mg	Al	Si	S	Cl	Ca	Fe
Weight Conc%	0.00	16.29	1.24	0.83	9.08	1.54	0.97	67.03	3.03



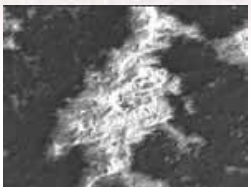
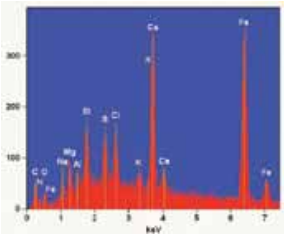


FIG. 1

MCI 2020 and MCI 2020M were analyzed to show their ability to migrate to embedded reinforcement, form a protective film, and mitigate corrosion. Testing showed that MCI protected samples had an average current density of 0.4 μA/cm^2 compared to 1.4 μA/cm^2 for untreated samples, increasing the service life expectancy by more than 15-20 years.

Weight Concentration %											
Untreated	N	O	Na	Mg	Al	Si	S	Cl	K	Ca	Fe
L2020_pt1	0.53	4.09	3.51	2.12	1.52	4.27	4.31	5.31	1.42	19.37	53.56
L2020_pt2	0.66	12.01		0.41	1.28	4.56	1.10	0.94		71.02	8.02



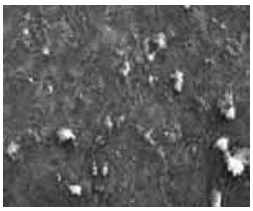
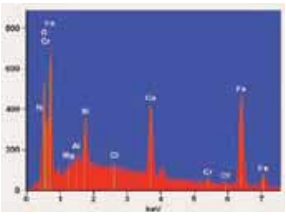


FIG. 2

Scanning electron microscopy (SEM) and energy dispersive X-ray microanalysis (EDX) was performed on rebar samples. Figure 1 shows an image for the untreated concrete sample, its spectrum and weight concentration percentage for elements typically found in concrete, corrosive species and rebar. Nitrogen, the active component in MCI corrosion inhibitors, is not detected. Nitrogen was detected in the MCI treated samples, as shown in Figures 2 and 3. The presence of nitrogen on the surface is significant because it confirms the inhibitors are able to migrate through the concrete to reach the surface of the rebar.

2020 M	N	O	Al	Si	S	Cl	Ca	Mn	Fe
Weight Conc %	0.46	3.81	1.52	5.13	0.74	1.82	22.71	0.78	63.02
Atom Conc %	0.61	10.46	2.48	8.06	1.02	2.26	24.89	0.62	49.61



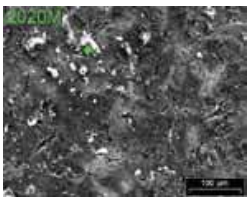
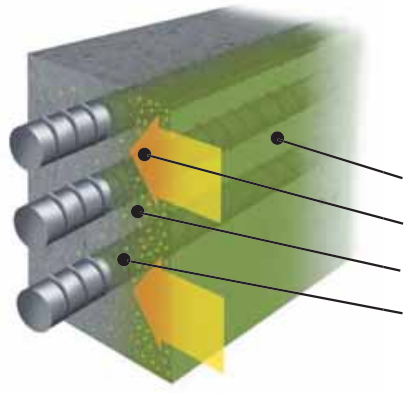


FIG. 3



MCI® Transport Mechanisms in Concrete

XPS depth profiling detected chloride at depths of 60 nm on the rebar while the presence of inhibitor on treated samples showed nitrogen detection levels at 85 nm below the unetched surface for the MCI 2020 M sample and as far down as 75 nm for the MCI 2020 sample. The XPS results showed similar diffusion rates for MCI and the corrosive species (chloride). The MCI inhibitors were able to adsorb to a deeper depth than the chloride ions on the rebar, providing a protective film, whereas untreated samples were subjected to localized corrosion attack.

Mass Concentration %

Sample	Etch Time (seconds)	Fe 2p	O 1s	C 1s	N 1s	Cl 2p	Ca 2p	Si 2p
Untreated	0	6.27	42.71	30.67	0.19	1.07	14.19	4.97
Untreated	120	13.60	39.43	23.08	0.14	1.06	17.59	5.19
Untreated	240	14.65	38.77	22.35	0.11	1.01	18.18	5.03
L2020	0	2.30	42.22	29.90	1.16	0.95	17.28	6.26
L2020	120	2.53	43.01	25.17	1.12	0.93	20.14	7.18
L2020	240	2.56	43.85	21.95	1.05	1.40	22.19	7.09
L2020M	0	2.02	40.20	38.55	1.32	0.87	11.54	5.53
L2020M	120	2.22	41.74	32.13	1.29	0.86	15.41	6.42
L2020M	240	2.82	43.61	28.99	1.15	0.83	15.92	6.68

Table 1 *- XPS analysis on concrete samples after 500 days, showing the changes in chemistry with etch time.*

Long-Term Corrosion Testing of MCI® 2020
(November 1994 - April 1999)

General Building Research Corporation of Japan,
Dr. Masaru Nagayama

CONCLUSION:

MCI® 2020 decreased the amount of corrosion in treated specimens versus control specimens. When MCI® 2020 is initially applied, corrosion is reduced by one-sixth that of untreated specimens. Throughout the investigation, corrosion in the MCI® 2020 treated specimen was reduced one-third to one-fifth that of the untreated specimen. Applying MCI® 2020 when cracks appeared worked very well in reducing corrosion in specimens with rebar at a 2 cm depth, but testing was too short to determine its effects on rebar at other depths.

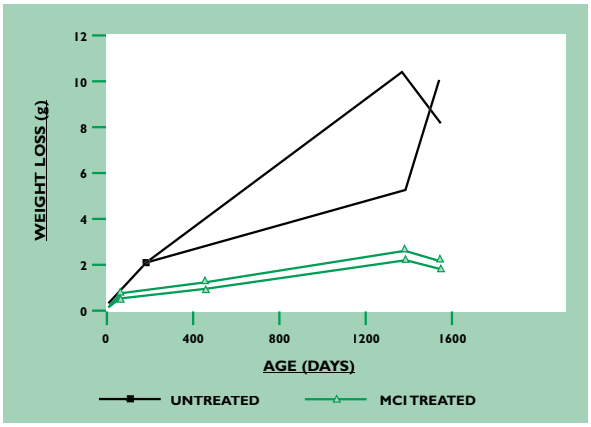


FIG. 4 *MCI® 2020 long term test 1994-95 by General Building Research Corporation of Japan*

METHOD:

Concrete specimens were prepared and cured for 60 days. The mix design of the concrete was: w/c ratio of 65%, 3 kg/m^3 of $C1_2$, slump of 19.5 cm, air content of 3.8%, and compressive strength of 29.3N/nm^2 at 28 days. One percent by weight of sodium chloride was added to mix design to assure acceleration of corrosive rates in this experiment. After 60 days, the specimens were observed to have corrosion and MCI® 2020 was applied to one specimen for comparison with the control. For the duration of the test, the specimens were exposed to the high temperature chamber and repetition of dry and high humidity cycles. The test specimens were prepared using 13 mm polished steel rebar and 13 mm cold finished carbon and alloy steel bars; supplement rebars were 10mm deformed steel bars and 10 mm steel bars for concrete reinforcement. They were placed with 2 cm and 3 cm cover thickness.

As shown at right, the visual observation of test slabs shows significant reduction of cracking in MCI® 2020 tested slabs as compared to control slabs. MCI® 2020 reduced the corrosion rate by 80% compared to the control over the four and a half year test period.

UNTREATED

TREATED *with MCI®*

Testing the Effectiveness of Migrating Corrosion Inhibitor MCI® 2020 on the Corrosion of Reinforcing Steel

Prof. Dr. Dubravka Bjegovic, Zagreb University, Croatia

ASTM: G109 testing was performed on control and MCI® 2020 treated concrete specimens. After one year of testing, MCI® 2020 treated samples had four times less total corrosion than the control specimens.

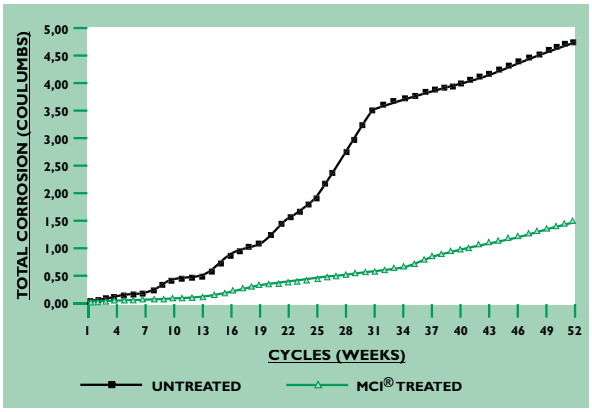


FIG. 5 *Zagreb University, Croatia*

MCI® Surface Applied Products

Migrating, Corrosion-Inhibiting Coating Technology that Extends the Service Life of Concrete

Corrosion in Concrete

It is estimated that corrosion costs the United States of America over $250 billion annually. That's about 4.2% of our Gross Domestic Product (GDP). A significant part of the cost is the result of corrosion-damaged concrete. As reinforcing steel in concrete corrodes, expansive forces cause the concrete to crack, then spall. This effect is seen every day on our nation's buildings, bridges, highways and other concrete structures.

How Rebar Corrosion Occurs:

THROUGH CHLORIDE ATTACK: Exposure to chlorides – most often in the form of de-icing salts or in salt water environments – can cause rapid and severe corrosion of rebar in concrete. Chloride ions destroy the natural protective effects of concrete on reinforcing steel, leading to rust formation.

THROUGH CARBONATION: Carbon dioxide in the air reacts with free lime present in the concrete and over a period of time reduces the pH of the concrete. Though generally a slower process than chloride attack, it nevertheless reduces the natural protection of the rebar and again results in corrosion.

Cathode Process:

$O_2 + 2H_2O + 4\ e^- \rightarrow 4OH^-$

Anode Process:

$Fe \rightarrow Fe^{++} + 2e^-$

The Electrochemical Corrosion Process

Once corrosion is initiated by chloride attack and/or carbonation, an electrochemical corrosion cell is created. Rust formation occurs at the anode as the steel reinforcing bar is ultimately converted to iron oxides. Since the volume of this rust is several times greater than the steel it replaces, expansive forces build up within the concrete, resulting in cracking and spalling.

How MCI® Surface Applied Products Work

Migration through hardened concrete occurs by liquid and vapor diffusion.

When MCI® reaches reinforcing steel, it forms a molecular, protective layer in both the anodic and cathodic areas. This effectively reduces the corrosion activity.

An Innovation For Fighting Corrosion In Hardened Concrete

MCI® 2020 is a revolutionary new impregnation coating designed to reduce corrosion in all types of concrete structures. When sprayed, brushed or rolled on concrete, this water-based, organic compound migrates through the hardened pore structure via diffusion. Upon contact with reinforcing steel, MCI® 2020 forms a monomolecular protective layer which reduces corrosion dramatically.

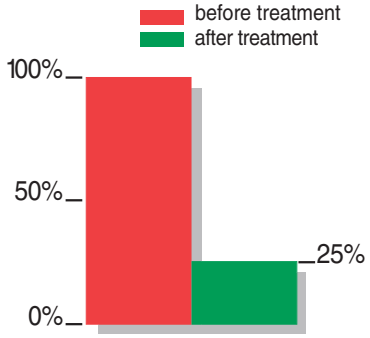
For Concrete Protection

After isolated repairs have been made, apply MCI® 2020 over the entire area. As the MCI® 2020 migrates, it protects the reinforcing steel and helps prevent additional cracking and spalling in the future.

For Concrete Overlays and Deep Repairs

After damaged concrete is removed, apply MCI® 2020 over the entire substrate prior to placing the overlay. Use MCI® corrosion-inhibiting admixture in the new overlay for added protection.

Actual Bridge Deck Evaluations (SHRP-S-666)

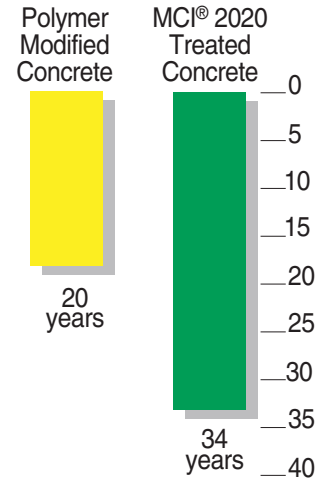


MCI® 2020 reduced corrosion currents 75%

Proven Effective by SHRP

MCI® 2020 was proven effective in both lab and field analysis as part of the Strategic Highway Research Program (SHRP). SHRP, a unit of the U.S. National Research Council, found MCI® 2020 to be one of the most promising new technologies available for concrete rehabilitation.

Predicted Service Life of Bridge Deck Overlays



Additional Tests Have Concluded

- MCI® 2020 can migrate and reach reinforcing steel.
- Migration readily takes place, even in dense, high-strength concrete.
- Performance of MCI® 2020 is not dependent on chloride levels in the concrete.
- MCI® 2020 is effective even in concrete with high chloride content and active corrosion.

Detecting MCI® in Hardened Concrete

Case history 255: MCI 2020 V/O & MCI 2005 Gel
Dayton, Ohio

"All repairs have proven successful. Cores were extracted to prove the migration of MCI 2020 V/O to the depth of embedded reinforcement.

Case History 263: MCI-2020
Inland Steel Building, Chicago, Illinois

"MCI-2020 has almost completely stopped further corrosion of the structural steel at the Inland Steel Headquarters and thus preserved the structural integrity of this historic building."

Case History 46: MCI 2020 V/O
Pentagon, Washington, DC

"MCI 2020 V/O together with a silicate based mineral coating were chosen to repair and protect the exterior walls based on their abilities to meet the repair design requirements and long term product warranties."

Case History 242: VpCI 611, MCI 2023, MCI 2020, MCI 2039, MCI 2021
Trinidad

"The HPRS system has performed very satisfactorily for Trinmar. An extensive repair program for other offshore oil platforms has been put into place, specifying Cortec's HPRS system."

Detecting MCI® 2020 in Hardened Concrete

1 Sometime after the MCI 2020 material has been applied (3 months, 6 months, 1 year, etc) and believed to have reached the desired depth of penetration, take core samples of the treated concrete. A control sample taken from untreated concrete can also be taken for comparison purposes. Core samples are preferred over drilling because there is a very high probability of contamination when drilling.

2 Measure the cores into 1 inch (~25 mm) sections. Cut the cores along these measurements and label the individual core pieces accordingly.

3 Grind or pound the individual core sections into small rubble (removing by hand any large chunks of aggregate or non-cementitious material). It is of the utmost importance that no cross contamination be allowed between samples.

4 Pulverize the samples into powder with a ceramic mortar and pestle. It is recommended that the powder is then passed through a coarse mesh funnel to remove any larger bodies which can hinder extraction.

5 Place each powdered sample into a separate, clean, dry beaker or jar (preferably of 50 mL size). Record the mass of the powder sample and add the same amount of deionized (or distilled) water to the sample. This will yield a 1:1 slurry dilution (by weight).

MCI® Projects

PROJECTS	LOCATION	PRODUCTS
Pilings for new condominium development	Venezuela	MCI-2002
Wastewater Passway Renovations	Inchon, Korea	MCI-2000
Bullet Train New Concrete Construction	Korea	MCI-2000
Charleswood Bridge - New Construction	Winnipeg, Canada	MCI-2000, MCI-2020
MN-DOT Randolph & I-35 Bridge Deck Overlay	St. Paul, MN	MCI-2000
ND-DOT Bridge	ND	MCI-2000
WA-DOT Hood Canal Bridge	WA	MCI-2000, MCI-2020
MN-DOT Pier Caps	Duluth, MN	MCI-2000
Turcot Irrigation Water Treatment Plant	CA	MCI-2000
MN-DOT Earl St. & I-94 Bridge Deck	St. Paul, MN	MCI-2000
Jamb Architects-Private Bldg.	St. Paul, MN	MCI-2000
IN-DOT Bridge	Indianapolis, IN	MCI-2000
Chemical Mfg. Plant Foundation Floors & Foundation	St. Paul, MN	MCI-2000
Wastewater Treatment Plant	Irrigation District, CA.	MCI-2000
Parking Garage Renovation	Houston, TX	MCI-2000
IN-DOT Vanderburgh County Bridge	Vanderburgh, IN	MCI-2000
Manitoba HWY. Dept. HWY. 1 & Portage Ave. Bridge.	Manitoba, Canada	MCI-2000
Alberta Hwy. Dept. Lloydminister Bridge	Alberta, Canada	MCI-2000
Parking Garage - New Construction	St. Louis, MO	MCI-2000
Hospital Parking Garage Renovations	St. Louis, MO	MCI-2000
Hotel Balcony Deck Repair	Honolulu, HI	MCI-2000
Paper Mill Renovations	Thunder Bay, Canada.	MCI-2000, MCI-2020
Manitoba HWY. Dept. - Bridge New Curbs & Sidewalks.	Thunder Bay, Canada.	MCI-2000
Alexandria Government Renovations	United Arab Emirates	MCI-2000, MCI-2020
El-Moassa Society Renovations	United Arab Emirates	MCI-2000, MCI-2020, MCI-2003
3M Garage Repair	St. Paul, MN	MCI-2000
City of St. Paul - Grand Ave. & AYD Mill Rd. Bridge	St. Paul, MN	MCI-2000, MCI-2020
Water Canal Renovations	Jamaica	MCI-2000
Ponte Po Bridge & Viaduct Renovations	Ponte Po, Italy	MCI-2000, MCI-2020, MCI-2023, MCI-2038, MCI-2039
Melide Viaduct Renovations	Melide, Switzerland	MCI-2000
General Motors Parking Garage Renovations	Detroit, MI	MCI-2000
MN-DOT Bridge Deck	Golden Valley, MN.	MCI-2000
Marina Renovations	Blaine, WA	MCI-2000
Xuzhou Railroad Bridge	China	MCI-2000 & MCI-2020, MCI-2021

PROJECTS	LOCATION	PRODUCTS
Petroleum Tan Foundations	Canton, OH	MCI-2000
MN-DOT Bridge Deck	Golden Valley, MN.	MCI-2000
Shenyang Railroad Bridge	China	MCI-2020, MCI-2021
Beijing Railroad Bridge	China	MCI-2020, MCI-2021
Inland Steel Building	Chicago, Il	MCI-2020
MN-DOT I-694 & US HWY. 61 Bridge	Maplewood, MN	MCI-2020
ME-DOT Rockport Bridge	Rockport, ME	MCI-2020
MN-DOT I-94 Bridge	Moorhead, MN.	MCI-2020
Plaza Deck Over Parking Garage	St. Paul, MN	MCI-2020
MN-DOT I-535 & I-35 Bridge	Duluth, MN	MCI-2020
Telephone Structure	St. Paul, MN	MCI-2020
Alberta HWY. Dept. Bridges	Alberta, Canada	MCI-2020
Parking Structure	Houston, TX	MCI-2020
Water Intake Structures	Saudi Arabia.	MCI-2020
Precast Manholes	Saudi Arabia.	MCI-2020
Hotel Balcony Repair	Honolulu, HI.	MCI-2020, MCI-2023
Municipal Utilities Light Standards	Ontario, Canada.	MCI-2020
Lighting Standards Renovation	Ontario, Canada.	MCI-2020
Alexandria University	United Arab Emirates	MCI-2020, MCI-2003
Bulk Material Shipping Train Shed Renovation.	Thunder Bay, Canada.	MCI-2020
Concrete Wall Renovation	Sezana, Slovenja	MCI-2023, MCI-2038, MCI-2039
Cooling Tower Renovations	Beruhazasi Foosztaly, Hungary	MCI-2020, MCI-2023, MCI-2038, MCI-2039
Via Motta Building Renovations	Lugano, Switzerland.	MCI-2020, MCI-2038
MN-DOT Bridge-Preventive Maintenance	MN	MCI-2020
Chemical Plant's Precast Walls - Preventative Maintenance	St. Paul, MN	MCI-2020
Condo Balconies Preventative Maintenance	Naples, FL	MCI-2020
Macomb County Courthouse	Macomb County, MI	MCI-2020
Federal Mogul Building Façade	Detroit, MI.	MCI-2020
Carlyle Tower Parking Deck	Detroit, MI.	MCI-2020
Monica Federal Building Façade	Lugano, Switzerland.	MCI-2020, MCI-2023
Pusan Subway Structures & Walls	Pusan, Korea	MCI-2020
Bulk Material Shipping Train Shed Renovation.	Thunder Bay, Canada.	MCI-2020

Visit our website for more information on case histories and test reports.

CortecMCI.com

- **MCI 2020 can be detected in concrete using a QAC (Quaternary Ammonium Compounds) test kit, in conjunction with alkalinity testing.**
- **Cortec uses EM Quant QAC test sticks, catalog number: 17920-1.**

6 Cover the containers and allow the slurry dilution to soak, stirring continuously, for at least 30 minutes. Note: Longer extraction with stirring will increase the chances of positive results. A magnetic stir plate and stir bar is recommended. Heat may aid the extraction but must not exceed 80 degrees F (~26 degrees C).

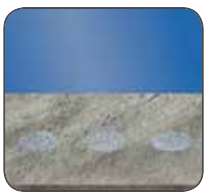
7 Use the manufacturer's instructions for the EM Quant QAC test sticks to analyze each slurry solution/extraction.

8 When testing the slurry for QAC, maintain stirring and immerse the test stick for 2 seconds.

9 Allow the test stick to develop for 60 seconds, and compare the reaction zone on the test stick with the color range on the EM Quant QAC test stick container.

10 Record the data, including: depth of core section, QAC presence (Y/N), concentration and/or concentration range (according to color comparison chart). This information can then be used to show how far the MCI inhibitors have migrated and how long the migration took.

11 NOTE: If there is no separation between the control (no MCI) and the experimental core sections (with MCI), then there is likely QAC interference. If this is the case, the 1:1 slurry extract mixture should be diluted serially until a proper separation is found, indicating MCI presence. Consult a Cortec representative for further details if necessary.



12 Dispose of materials and fill in core holes.

	Product	Description	Protection	Packaging	Applications
Surface Applied Inhibitors	MCI 2020	Clear MCI surface treatment for existing structures. Designed to penetrate and migrate throughout substrate seeking out embedded metals.	150 ft²/gal (3.68 m²/l) Medium term protection.	5 gallon (19 liter) pails, 55 gallon (208 liter) drums	Spray, brush or roller apply. Provides MCI protection to embedded metals. Has UL approval to meet NSF Standard 61 Certification for indirect contact with potable water. Applications include bridges, buildings, parking garages, decks and lanais.
	MCI 2020 V/O	MCI 2020 for veritcal and overhead applications.	150 ft²/gal (3.68 m²/l) Medium term protection.	5 gallon (19 liter) pails, 55 gallon (208 liter) drums	Spray, brush or roller apply. Provides MCI protection to embedded metals. Has UL approval to meet NSF Standard 61 Certification for indirect contact with potable water. Applications include bridges, buildings, parking garages, decks and lanais.
	MCI 2020 Powder	Powder version of MCI 2020, one 100 lb (45.35 kg) drum makes 55 gallons (208 liters) of MCI 2020 ready to use liquid.	150 ft²/gal (3.68 m²/l) Medium term protection.	100 lb (45.35 kg) drums.	Powdered MCI 2020 to be diluted with water to make ready to use product. Spray, brush or roller apply. Has UL approval to meet NSF Standard 61 Certification for indirect contact with potable water. Applications include bridges, buildings, parking garages, decks and lanais.
	MCI 2020 V/O Powder	Powder version of MCI 2020 V/O, one 100 lb (45.35 kg) drum makes 55 gallons (208 liters) of MCI 2020 V/O ready to use liquid.	150 ft²/gal (3.68 m²/l) Medium term protection.	100 lb (45.35 kg) drums.	Powdered MCI 2020 V/O to be diluted with water to make ready to use product. Spray, brush or roller apply. Has UL approval to meet NSF Standard 61 Certification for indirect contact with potable water. Applications include bridges, buildings, parking garages, decks and lanais.
	MCI 2020 M	Concentrated version of MCI 2020 that provides even better corrosion protection. One 55 gallon drum of MCI 2020 M makes two 55 gallon drums of ready to use product.	150 ft²/gal (3.68 m²/l) Medium term protection.	55 gallon (208 liter) drums.	After 1:1 dilution with water, spray, brush or roller apply. Has UL approval to meet NSF Standard 61 Certification for indirect contact with potable water. Applications include bridges, buildings, parking garages, decks and lanais.
	MCI 2020 M Ready to Use	New version of MCI 2020 that provides even better corrosion protection.	150 ft²/gal (3.68 m²/l) Medium term protection.	5 gallon (19 liter) pails, 55 gallon (208 liter) drums	Ready to Use product. Spray, brush or roller apply. Has UL approval to meet NSF Standard 61 Certification for indirect contact with potable water. Applications include bridges, buildings, parking garages, decks and lanais.
	MCI 2020 M V/O	Newer version of MCI 2020 V/O with even better corrosion protection. Ready to use formulation.	150 ft²/gal (3.68 m²/l) Medium term protection.	5 gallon (19 liter) pails, 55 gallon (208 liter) drums	Ready to use formulation. Spray, brush or roller apply. Has UL approval to meet NSF Standard 61 Certification for indirect contact with potable water. Applications include bridges, buildings, parking garages, decks and lanais.
Sealers with MCI Inhibitors	MCI 2019	40% Silane sealer containing MCI inhibitor.	125 ft²/gal (3 m2/liter) Medium term protection.	5 gallon (19 liter) pails, 55 gallon (208 liter) drums	Low VOC, solvent based silane sealer. Spray, brush or roller apply. Applications include bridges, buildings, parking garages, decks and lanais.
	MCI 2021	Silicate sealer containing MCI inhibitor. Patented.	150-250 ft²/gal (3.7-6.1 m²/l) Medium term protection.	5 gallon (19 liter) pails, 55 gallon (208 liter) drums	Spray, brush or roller apply. Preserves and protects concrete. Applications include bridges, buildings, parking garages, decks and lanais.
	MCI 2022	Silane/siloxane blend sealer containing MCI inhibitor. Patented.	125-175 ft²/gal (3-4.2 m²/liter) Medium term protection.	5 gallon (19 liter) pails, 55 gallon (208 liter) drums	Spray, brush or roller apply. Applications include bridges, buildings, parking garages, decks and lanais.
	MCI 2022 V/O	Vertical and Overhead version of MCI 2022. Patented	125-175 ft²/gal (3-4.2 m²/liter) Medium term protection.	5 gallon (19 liter) pails, 55 gallon (208 liter) drums	Spray, brush or roller apply. Applications include bridges, buildings, parking garages, decks and lanais.
Coatings/Specialty Products	MCI 2005 Gel	MCI 2005 in gel format fo injection into existing structures.	1.0 pt/yd³ Medium term protection.	24 oz (680 g) caulking tubes, 5 gal (19 l) pails, 55 gal (208 l) drums.	Inject into pre-drilled holes to provide easy and renewable MCI corrosion protection on existing structures.
	MCI 2026 Primer	Two-component, chemically resistant, water-based primer for concrete.	250-350 ft²/gal (6.1-8.5 m²/l) Medium term protection.	0.75 gal (2.3 l), 6 gal (22.7 l), 15 gal (56.8 l), 165 gal (624.6 l) yield kits.	Recommended primer for the MCI 2026 Floor Coating. Designed for use on concrete surfaces. Meets USDA guidelines for use in meat and poultry plants. Can be colored using MCI HPCS Colorants.
	MCI 2026 Floor Coating	Two-component, chemically resistant, 100% solids Novolac epoxy for concrete.	125-150 ft²/gal (3.0-3.7 m²/l) Medium term protection.	0.6 gal (2.27 l), 5 gal (19 l), 12.5 gal (47.3 l), 138 gal (522.4 l) yield kits.	Recommended topcoat for MCI 2026 primer. Excellent chemical and abraison resistance, odorless and meets USDA guidelines for use in meat and poultry plants. Can be colored using MCI 2026 HPCS Colorants.
	MCI Anti Graffiti Coating	Two-component, solvent based aliphatic urethane for concrete to provide easy removal of graffiti.	516 ft²/gal (13 m²/l) at 2 mils (50 microns) DFT. 3-10 years depending on severity of conditions.	10 gallon yield kits.	Designed for use on concrete surfaces as well as steel or on top of other solvent based coatings. Remove graffiti from coating using most solvents or Cortec VpCI 432 or VpCI 433.
	MCI Architectural Coating	Water based, acrylic primer/top coat.	535-641 ft²/gal (13-16 m²/l) Medium term protection.	5 gallon (19 liter) pails, 55 gallon (208 liter) drums	Aesthetically pleasing coating for concrete that provides resistance to water ingress and carbonation. UV resistant when cured.
	MCI Coating for Rebar	Water based, barrier coating that provides extended outdoor protection for exposed steel and aluminum.	300 ft²/gal (7.3 m²/l) 6-24 month protection in outdoor, exposed environments	5 gallon (19 liter) pails, 55 gallon (208 liter) drums	Remove oils and grease residue from surfaces. Will not damage painted or sealed surfaces.
	MCI Coating for Rebar NT	Non-tacky version of MCI Coating for Rebar.	300 ft²/gal (7.3 m²/l) 6-24 month protection in outdoor, exposed environments	5 gallon (19 liter) pails, 55 gallon (208 liter) drums	Remove oils and grease residue from surfaces. Will not damage painted or sealed surfaces.

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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies
4119 White Bear Parkway, St. Paul, MN 55110 USA
Phone (651) 429-1100, Fax (651) 429-1122
Toll Free (800) 4-CORTEC, E-mail info@cortecvci.com
Internet http://www.cortecvci.com

Revised: 05/06 Supersedes: 07/05.

Printed on recycled paper ♻ 100% Post Consumer

HPRS®

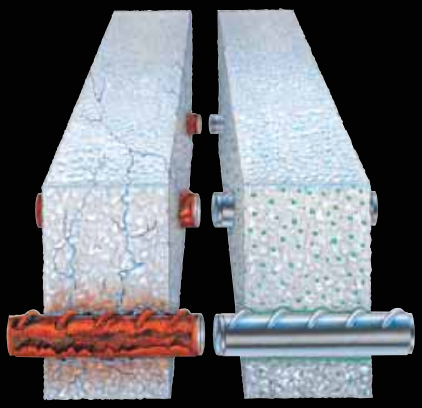
High Performance Repair Systems with Extra High Concentrations of MCI®

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.

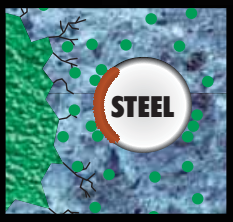
The MCI® Concept

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

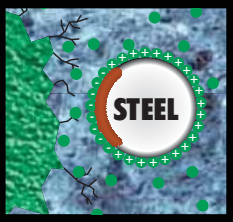
The migration process of MCI® molecules is based on their ability to diffuse in both vapor or liquid form. They penetrate into even the smallest pores and cavities; and are attracted to both anodic and cathodic areas of embedded metallic reinforcement. This physical adsorption onto metal surfaces provides 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.



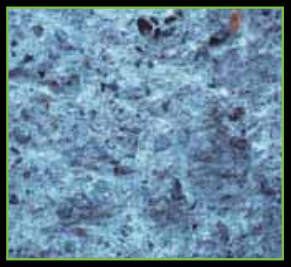
Cortec® MCI® migrates through concrete to protect steel – The inhibitor will migrate a considerable distance through the concrete to deposit itself on the internal bars.



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

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.

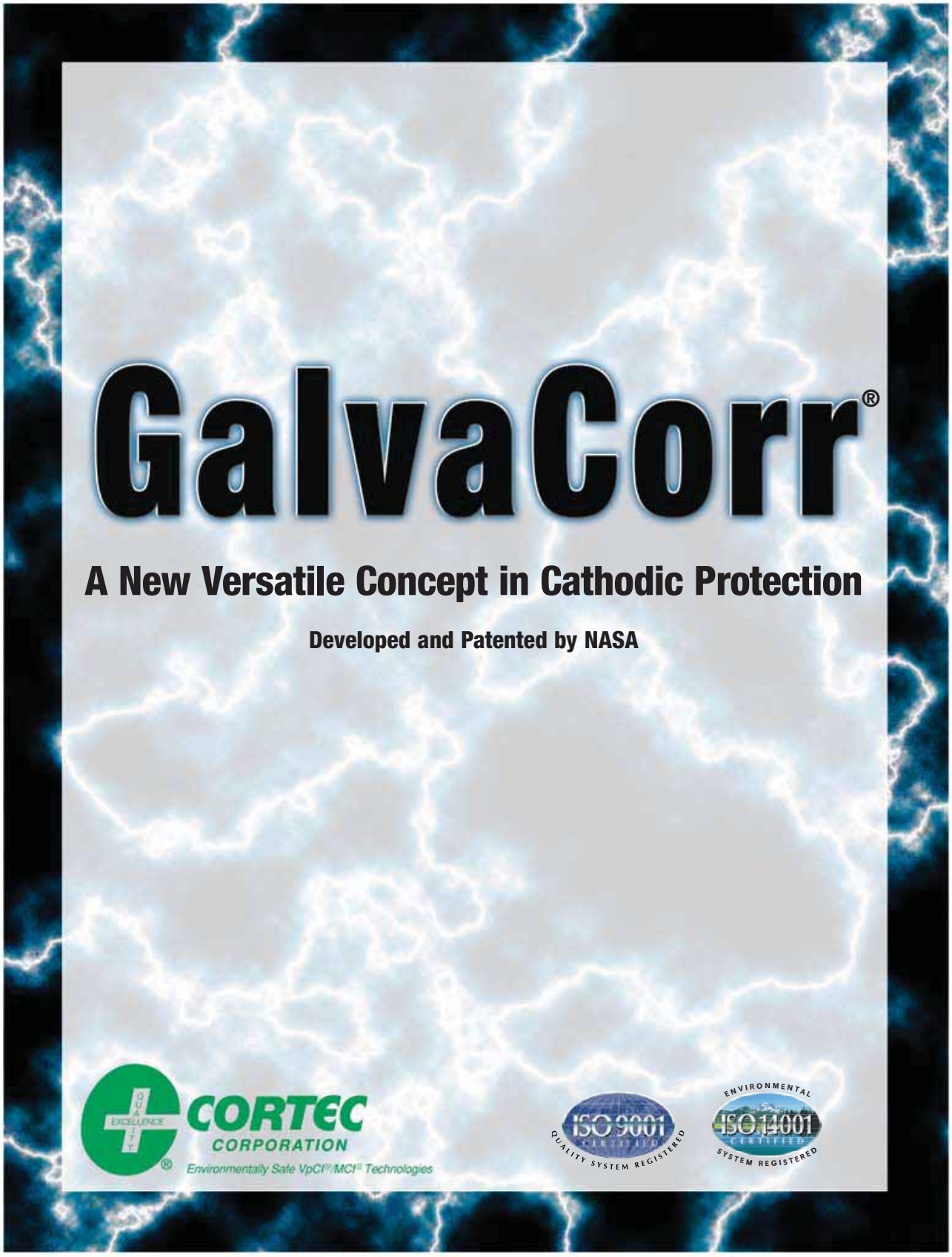
Cortec® Corporation
4119 White Bear Parkway, MN 55110
Phone (651) 429 1100, Fax (651) 429 1122
Toll Free (800) 4 CORTEC,
www.CortecMCI.com

Distributed by:

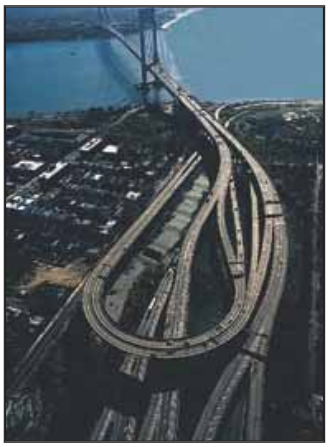
CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

printed on recycled paper ♻ 100% post consumer

Revised: 05/13 Supersedes: 09/10.


GalvaCorr®
A New Versatile Concept in Cathodic Protection
Developed and Patented by NASA
CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies
ISO 9001 CERTIFIED
QUALITY SYSTEM REGISTERED
ENVIRONMENTAL
ISO 14001 CERTIFIED
SYSTEM REGISTERED

A New Type of Galvanic Protection



Developed and Patented by NASA

A new reinforced concrete structure is designed to have a long service life – typically in excess of 50 years. Unfortunately, many structures fall short of this goal, requiring expensive repair and protection work in the future.

A major reason for the premature deterioration of our reinforced concrete infrastructure is ***corrosion of the reinforced steel.***

Galvanic protection of embedded steel rebar for existing structures. Suppresses corrosion in carbonated and chloride-contaminated concrete. Extends life of concrete structures.

Galvanic protection of embedded steel rebar for existing structures. Suppresses corrosion in carbonated and chloride contaminated concrete and extends life.

GalvaCorr® is a three component moisture cured metallic rich coating. The new coating provides cathodic protection and when connected to the steel rebar galvanically stops corrosion.

- Can be applied by spray, brush or roll coating.
- Recommended for bridges, decks, ramps and garages.
- Can be applied to uneven surfaces and to the underside of structures.

The use of a sacrificial metal to protect another metal goes back a century. This proven technology has been used in many forms. Now there is a new form available to protect the embedded steel rebars in concrete structures.

GalvaCorr® is a room temperature liquid coating that can be sprayed or hand applied to concrete structures. It is easily applied to vertical, horizontal and overhead surfaces. The coating can be applied to structures of many shapes.

GalvaCorr® can reach the rebar corrosion process electrically, inside the concrete to slow or stop this internal destruction. Without this galvanic protection, embedded steel/concrete structures may continue to deteriorate until failure.

GalvaCorr® galvanic protection is 30-50% less expensive than 3M's Zinc Hydrogel Anode System

Since GalvaCorr® is 90% metal, scratching the surface of the coating will reveal a metallic sheen.

Note rust bubbling out at the base of the rebar on the sample that is not connected to the coating for galvanic protection. These samples were in a humidity chamber for six months.

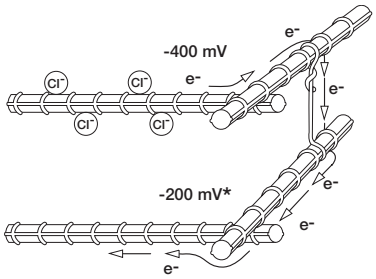
An Innovation that Fights Corrosion and Extends the Service Life of Reinforced Concrete Structures

Underside application by the St. Paul traffic department on the 30 year old bridge on Maryland Ave. The GalvaCorr® was hand applied with rollers. The project included sandblasting, excavating to connect the rebar and to assess the condition of the rebars, applying the coating wires and then the coating.

This is the finished coating and wiring system. A small junction box is visible above the ladder. This box is used to take the system readings. A St. Paul Department observation was: “There is nothing to vandalize or steal.”

Here, the almost invisible current collecting wires of the coating are highlighted. Part of the insulated current return wire to the rebars is visible over the pier arch.

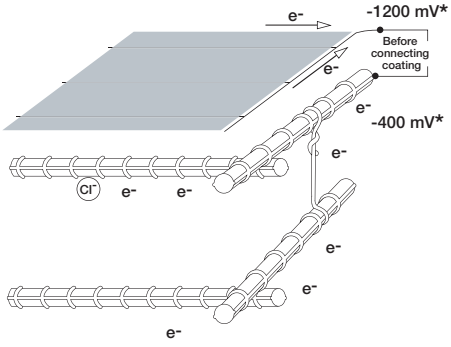
Cathodic Protection Diagram



Chloride concentration differences in concrete cause electro-chemical corrosion.

This corrosion converts the steel rebar into rust.

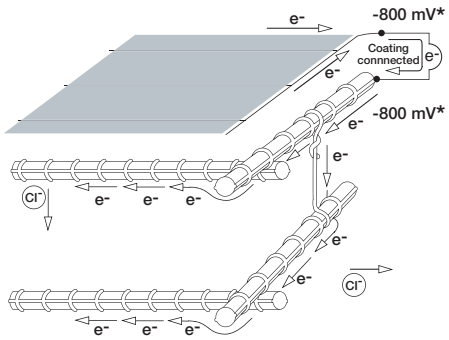
* Potentials if rebars were not connected.



The liquid applied galvanic coating provides a large anodic surface area. This large anodic area assures galvanic protection of the embedded steel rebar.

Connection wires are attached to the concrete surface. The coating is applied over the wires.

* To copper sulfate reference cell



When the GalvaCorr® galvanic coating is electrically connected to the rebar, a galvanic current begins. The higher negative potential on the rebar repels the negative chloride ions. The corrosion to the rebar is suppressed.

* To copper sulfate reference cell

PRODUCT	DESCRIPTION	COVERAGE	PACKAGING	APPLICATIONS
GalvaCorr®	GalvaCorr® is a galvanic coating for concrete that uses metallic particles to provide cathodic protection of the steel rebar. GalvaCorr® is electrically connected to the rebar and galvanically stops corrosion.	150 sq. ft./gal. (3.6 m²/L)	52 lb./ 3.9 gal. kit (23.6 kg./ 14.82 l kit)	Bridges, parking decks, ramps, garages, concrete piers, offshore platforms, piles, pillars, pipes, buildings, foundations and underside application to structures

Total Corrosion Control

Cortec® Corporation is dedicated to controlling corrosion at ALL STAGES of a product life cycle. Cortec® has developed a diverse range of corrosion protection products including cleaners, metalworking fluids, water- and oil-based coatings and corrosion inhibitors, rust removers, paint strippers, powders, packaging foams, paper, films and surface treatments and admixtures for concrete. Contact Cortec® for additional brochures and information.

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.

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies
4119 White Bear Parkway, St. Paul, MN 55110 USA
Phone (651) 429-1100, Fax (651) 429-1122
Toll Free (800) 4-CORTEC, E-mail info@cortecvci.com
Internet http://www.CortecMCI.com

Distributed by:

printed on recycled paper 100% post consumer

Revised: 02/09 Supersedes: 05/06


CORTEC
CORROSION ENGINEERING
& FIELD SERVICES

Cortec® Corporation:

Now Provides Engineering and Field Services in Addition to its Worldclass Assortment of Corrosion Control Products

Cortec® Corporation of St. Paul, Minnesota has expanded its business and launched a Cortec's Corrosion Engineering and Field Services (CEFS) group. This group is focused on providing each customer with optimum corrosion control solutions to meet their needs. The scope of services for Cortec's CEFS include a variety of corrosion control design, engineering, and field applications serving Cortec® customers worldwide. If you need a service that is not addressed in this brochure or on our website – please contact us - we will welcome the opportunity to assist you. CEFS is committed to providing a cost effective service designed to ensure our customers receive the correct products, technologies, and applications the first time, every time.

The primary focus of CEFS includes:

1. **Delivery of exceptional design & engineering services for development of effective corrosion control solutions and comprehensive corrosion management programs.**

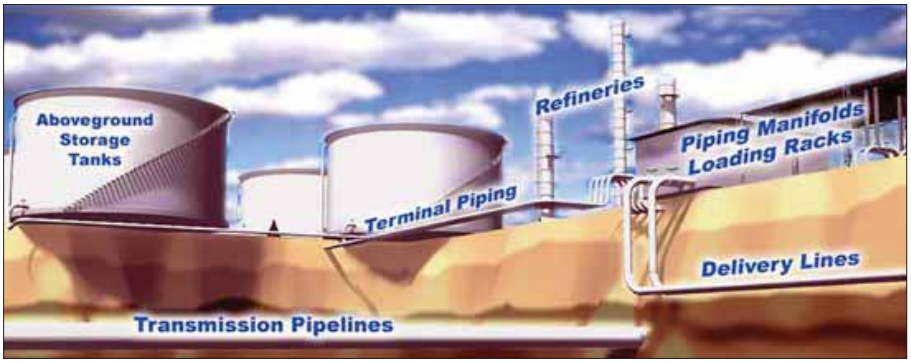
2. **Delivery of advanced applications and installations of corrosion control systems worldwide.**

Our corrosion control solutions include, but are not limited to, a wide array of Vapor phase Corrosion Inhibitor(VpCI®) delivery systems, high performance coatings and linings, corrosion monitoring as well as cathodic protection alternatives.

CEFS is comprised of internal Cortec resources, plus a substantial group of experts available through Cortec's well developed, worldwide group of licensed distributors and contractors. Together we are able to provide our customers with a sole-source supplier of:

- **Engineered corrosion control solutions.**
- **Technologically advanced corrosion control products and processes.**
- **Safe, professional, and effective delivery of corrosion control services.**

The CEFS team welcomes all opportunities to assist our customers with controlling corrosion of their equipment, plants, concrete structures, pipelines, tanks, etc. in order to extend the useful life of these assets to their practical limits - and beyond.



Engineering Services

Innovative Corrosion Control Engineering & Design Solutions

Cortec's CEFS team works hard for its customers to solve virtually any corrosion control challenge. We are able to utilize a wide array of technologies and resources. Innovation is a specialty and we welcome the opportunity to provide custom designed corrosion control solutions.

Corrosion control system solutions are designed using:

- **The tremendous selection of Cortec® Vapor phase Corrosion Inhibitor (VpCI®) technologies.**
- **Cathodic protection technologies where applicable.**
- **Other corrosion control technologies where applicable.**

Total Facility Corrosion Management Programs

Effective mitigation of asset/facility corrosion begins with well engineered comprehensive programs that are designed to produce coordinated application of the appropriate technologies. Cortec's CEFS group is focused on providing each customer with the optimum corrosion control solutions to meet their needs through organized corrosion management programs.

- **Corrosion Audits.** Comprehensive audits/analysis of individual facility assets that are potentially affected by corrosion. Audits are designed to identify both – areas with satisfactory attainment of corrosion control and areas with corrosion control deficiencies.
- **Baseline Assessments.** This type of assessment is designed to evaluate the effectiveness of operating corrosion control systems/programs and identify any deficiencies or recommended revisions.
- **Corrective Action Programs.** This is follow-up to the previous evaluations. CEFS provides custom turnkey solutions for mitigation of identified corrosion control deficiencies. These programs can be tailored for compatibility with annual budgets as necessary.

Real-time Corrosion Monitoring Programs

Corrosion monitoring can be utilized in many forms. It is valuable for identification of areas where proactive corrosion control systems are needed. It is also important to incorporate effective monitoring of active corrosion control systems in order to ensure their effectiveness.

- **CEFS is committed to designing corrosion monitoring programs that utilize state of the art equipment and technologies to accurately and efficiently monitor real-time corrosion.**
- **Corrosion monitoring systems can be stand alone or in conjunction with existing corrosion control systems.**

Turnkey Corrosion Control Applications

Equipment Preservation

Cortec® has provided turnkey support for many years for equipment preservation projects - now we can provide engineering needed through the final application of all preservation technology and products required to effectively mitigate corrosion during downtime.

- **This includes preservation during shipment, storage, temporary shut-down, or long-term mothballing.**
- **Corrosion protection is provided to all surfaces, both internal and external through the multiple delivery systems available with Cortec Vapor phase Corrosion Inhibitor (VpCI®) technologies.**
- **VpCI® preservation applications include a variety of cleaning products, surface coatings, powders and liquids for fogging of large spaces, additives for lubricants and process liquids, as well as films for total encapsulation.**
- **With CEFS, real-time corrosion rate monitoring systems for critical assets are available.**
- **Assistance with removal of preservation products is also available during future equipment recommissioning.**

Plant Layup

Cortec® expertise in turnkey corrosion control engineering by CEFS and applications services for comprehensive lay-ups of individual units or entire plants is augmented with implementation of a comprehensive plant layup package could include:

- **A corrosion audit for identification of all facility corrosion control requirements.**
- **A comprehensive plan to mitigate internal and external corrosion on all plant assets – both above ground and underground.**
- **Turnkey application of all corrosion control systems.**
- **Monitoring and maintenance of corrosion control systems during the layup period.**
- **Future assistance with the transition from the layup phase to plant commissioning.**

Control of Embedded Reinforcement in Concrete Structures

Cortec® is committed to enhancing the delivery and utilization of the outstanding array of Cortec® Migrating Corrosion Inhibitors (MCI®) products and technologies available for mitigation of embedded reinforcement corrosion. Turnkey concrete corrosion control solutions include:

- **Comprehensive plans for the mitigation of embedded reinforcement corrosion on any type of structure.**
- **Custom engineered corrosion monitoring systems designed to evaluate the corrosion rates of embedded reinforcement.**
- **Turnkey application of Cortec's numerous MCI® products on any structures.**

Above Ground Storage Tank Corrosion Control

Corrosion control of aboveground storage tanks (ASTs) is a specialty. CEFS offers turnkey corrosion control system designs & installations for virtually any type of AST construction; and for entire facilities where these tanks are located.

- **Baseline assessments can be provided that are designed to evaluate the effectiveness of existing corrosion control systems and identify any deficiencies.**
- **Total corrosion management systems are available for these tanks and/or entire facilities where these tanks are located.**
- **Double Contained ASTs. Engineered systems utilizing VpCI® technology, in lieu of cathodic protection, have proven to be effective for double contained AST floors. These systems are offered as a retrofit on operating ASTs, or are routinely coordinated with the construction of new ASTs.**
- **Single Bottom ASTs. Cathodic protection systems for single bottom AST floors are available as a retrofit on operating ASTs, or are routinely coordinated with the construction of new ASTs.**
- **Monitoring systems are also offered to evaluate the effectiveness of existing and new corrosion control systems while measuring the real-time corrosion rates of the steel surfaces.**

Corrosion Control of Hydro-tested Structures

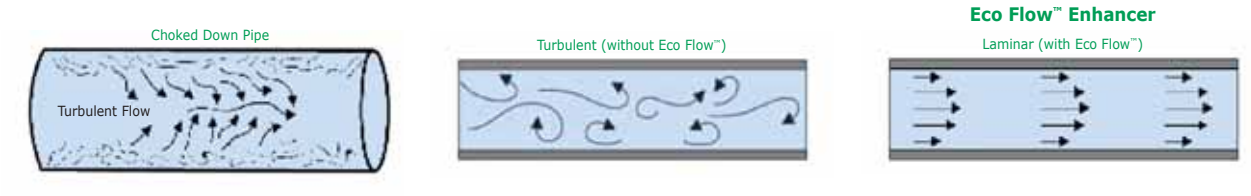
Cortec® has turnkey engineered solutions to control corrosion within vessels and pipelines during the hydro-testing process.

- **If desired a comprehensive program can be structured to provide corrosion control while water is inside the asset, then also after the water is drained.**
- **Corrosion control solutions are available for any type of water used during the hydro-test, including salt water.**

Application of Eco-Flow Technologies to Wells and Flow Lines

Cortec®, also is able to provide an engineered solution to flow enhancement within depleted oil fields and pipelines carrying 10% or greater water. The basis of this solution revolves around the utilization of Cortec's Eco Flow™ system.

- **The Eco Flow™ system is an optimal combination of flow enhancing and corrosion- protecting products allowing increased throughput, along with the unique effect of VpCI® protection, for pipelines carrying water or a mixture of water and hydrocarbons.**
- **Custom designed injection skids are also available.**



Pipeline Corrosion Inhibitors

Engineered systems utilizing Cortec's unique (VpCI®) technologies are available to control internal corrosion in pipelines transporting most liquids or gases.

- **Internal pipeline corrosion control solutions are available for a wide range of refined hydrocarbons, crudes, and oil/water mixes.**
- **Solutions are also available to provide effective internal corrosion control in natural gas production and transmission lines. These non-emulsifying formulations also provide corrosion mitigation in "sweet/sour" saturated carbon dioxide/hydrogen sulfide environments.**
- **VpCI® products form an effective corrosion inhibiting barrier for both ferrous and nonferrous metals in the presence of water, halogens and corrosive gases such as dissolved oxygen, sulfur dioxide, carbon dioxide, and hydrogen sulfide.**
- **The vapor phase component provides corrosion protection in pipeline headspaces and areas not directly contacted by the pipeline products.**
- **Solutions for high temperature products available.**
- **Real-time corrosion rate monitoring systems are also available.**

Corrosion Control of Process System Components

Comprehensive packages of engineered solutions are available, to continuously mitigate the wide variety of corrosion challenges for all types of process system equipment. Our capabilities include:

- **A corrosion audit for identification of all facility corrosion control requirements.**
- **A comprehensive plan to mitigate internal and external corrosion on all plant assets – including above ground / underground; and ambient / high temperature components.**
- **Turnkey application of all approved corrosion control systems.**
- **Monitoring and maintenance of corrosion control systems.**

Surface Coatings

Utilization of Cortec's advanced suite of coatings products containing VpCI® technology provides us with unique solutions for surface coating challenges.

- **Both temporary and permanent coatings programs can be provided.**
- **Coatings systems that do not require sandblasting or other rust removal provide interesting options.**
- **Custom colors are available.**

Use of Corrosion Inhibitors for Control of Corrosion in Double Bottom AST's.

Double bottom tank installations, and tanks with HDPE liner containment, often create unique corrosion control challenges. Many years of experience have proven that control of corrosion, by cathodic protection, of tank bottoms that are separated by a distance of less than about 10 to 12 inches is problematical. Cathodic protection systems are also nearly impossible to maintain, install or replace on a retrofit basis once this type of tank is in service.

Research and fieldwork indicates that corrosion control can be achieved using Vapor phase Corrosion Inhibitors (VpCI®) within double bottom or lined containment environments. Real world experience utilizing VpCI's for void space corrosion control over a 15-year time span has confirmed the longevity of this approach. Corrosion inhibitors are effective alone or in combination with CP. Inhibitors have a long history of corrosion protection under numerous types of conditions (wet corrosive environments and void spaces).

Corrosion Mitigation with Corrosion Inhibitors

Corrosion Inhibitor Basics

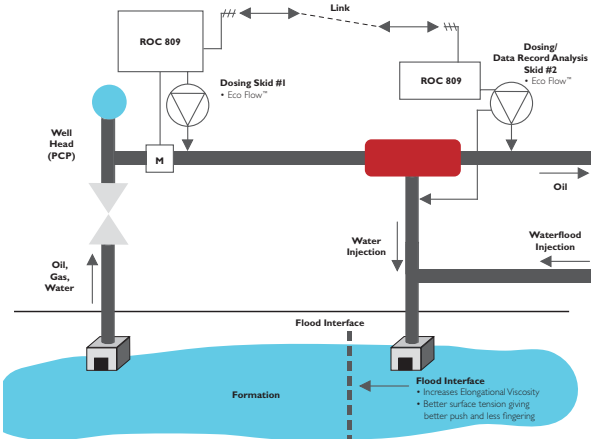
Vapor corrosion inhibitors have been used for many years to solve the basic corrosion control problem for metal surfaces in a confined space. Inhibitors have been used by the oil and chemical industry for over 50 years, minimizing difficult corrosion problems. For over 30 years Cortec® Corporation has investigated these compounds and developed a series of low toxicity inhibitors. A key characteristic of these materials is that they protect against corrosion in the presence of water, vapor, chlorides, hydrogen sulfide, sulfur dioxide, nitrogen oxides, and other compounds found in a corrosive industrial environment.

Services to Industries Worldwide

Many of the Services and applications provided by Cortec® are listed below. Please contact us with interest in these; or with any corrosion control needs.

Oil & Gas - Upstream

Innovative Corrosion Control Engineering & Design Solutions
Facility Corrosion Management Programs
Corrosion Monitoring Systems
Equipment Preservation
Plant Layup
Control of Corrosion Under Insulation
Aboveground Storage Tank Corrosion Control
Corrosion Control of Hydro-tested Structures
Application of Eco-Flow Technologies to Wells and Flow Lines
Pipeline Corrosion Inhibitors
Corrosion Control of Process Systems
Surface Coatings



Oil & Gas - Downstream

Innovative Corrosion Control Engineering & Design Solutions
Facility Corrosion Management Programs
Corrosion Monitoring Systems
Equipment Preservation
Plant Layup
Control of Corrosion Under Insulation
Above Ground Storage Tank Corrosion Control
Corrosion Control of Hydro-tested Structures
Pipeline Corrosion Inhibitors
Corrosion Control of Process Systems
Surface Coatings

Concrete Structures

Innovative Corrosion Control Engineering & Design Solutions
Facility Corrosion Management Programs
Corrosion Monitoring Systems
Control of Embedded Reinforcement in Concrete Structures

Process Industries

Innovative Corrosion Control Engineering & Design Solutions
Facility Corrosion Management Programs
Corrosion Monitoring Systems
Equipment Preservation
Plant Layup
Control of Embedded Reinforcement in Concrete Structures
Control of Corrosion Under Insulation
Above ground Storage Tank Corrosion Control
Corrosion Control of Hydro-tested Structures
Pipeline Corrosion Inhibitors
Corrosion Control of Process Systems
Surface Coatings

Military Installations Worldwide

Innovative Corrosion Control Engineering & Design Solutions
Facility Corrosion Management Programs
Corrosion Monitoring Systems
Equipment Preservation
Plant Layup
Control of Embedded Reinforcement in Concrete Structures
Control of Corrosion Under Insulation
Aboveground Storage Tank Corrosion Control
Corrosion Control of Hydro-tested Structures
Pipeline Corrosion Inhibitors
Corrosion Control of Process Systems
Surface Coatings

ISO 9001 CERTIFIED QUALITY SYSTEM REGISTERED

ISO/IEC-17025 LABORATORY TESTING CERTIFIED

ENVIRONMENTAL ISO 14001 CERTIFIED SYSTEM REGISTERED

Director of Engineering & Field Services
Contact:
Tim Whited
Office: 303-258-0356
twhited@cortecvci.com

Oil & Gas/Process Industries
Contact:
Jim Holden
Office: 804-639-7644
jholden@cortecvci.com

MCI®/Concrete Construction
Contact:
Jessi Meyer
Office: 651-429-1100 ex.185
jessij@cortecvci.com

General Information
Contact:
Cliff Cracauer
Office: 651-429-1100 ex.181
cliff@cortecvci.com

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

Visit our websites for more information on Cortec® Corporation.
CortecVCI.com and CortecMCI.com

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.

Revised: 09/10 Supersedes: 01/10

Distributed by:

8.1
New Construction

MCI Fiber Grenades®

Patent Pending

PRODUCT DESCRIPTION

MCI Fiber Grenades consist of both fiber and powders containing Migrating Corrosion Inhibitors packaged in water-soluble PVA bags. A MCI Fiber Grenade is very convenient to use. One 1.25 lb (0.56 kg) bag per 1/2 cubic yard or one 1.7 lb (0.8 kg) MCI Metric Grenade bag per 1/2 cubic meter provides excellent protection to steel reinforcement.

The bag dissolves easily when in contact with water in the concrete mix. After approximately 2 minutes of mixing, the bag will completely dissolve and the MCI compounds will disperse in the mix.

The MCIs protect reinforcing steel, galvanized steel and other metals embedded in concrete from corrosion induced by carbonation, chloride and atmospheric attack. When incorporated into the concrete mix, the MCIs form a corrosion inhibiting protective layer on metals. When used with repair mortars and grouts, MCIs will migrate toward the rebars, providing effective corrosion protection.

The polypropylene based fibers in MCI Fiber Grenades add mechanical and corrosion inhibiting benefits. Shrinkage cracking decreased 66%, while the residual strength doubled when compared to concrete alone. The MCI Fiber Grenades also add extra long corrosion protection because the MCI is released more slowly. MCI Fiber Grenades provide corrosion protection from atmosphere and chloride attack, as well as from carbonation.

WHERE TO USE

MCI Fiber Grenades are recommended for:

- All reinforced, precast, prestressed, post-tensioned or marine concrete structures
- Steel-reinforced concrete bridges, highways and streets exposed to corrosive environments (carbonation, deicing salts and atmospheric attack)
- Parking decks, ramps and garages
- Concrete piers, piles, pillars, pipes and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures

ADVANTAGES

- Offers engineers, owners, contractors, DOTs and government agencies a time proven corrosion inhibiting technology that will extend the life of reinforced concrete structures
- Protects against the harmful effects of corrosion even in the densest concrete
- Shrinkage cracking reduction of 66%
- Does not affect the air entrainment, compressive strength or the set time of concrete mix
- Required dosage is not affected by chloride concentration
- Does not contain calcium nitrite
- Non-flammable and environmentally friendly
- Lab and field tested
- Concentrated for cost effectiveness on all projects
- Will migrate to adjacent areas to protect surrounding metals

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

APPLICATION

MCI Fiber Grenades can be added to concrete at the ready-mix plant, directly to the ready-mix truck drum or to portable mixers. Mix concrete thoroughly for at least 5-10 minutes at a rate of at least 15 rpm after PVA bag is dissolved to disperse the MCI.

For best results at the batch plant, add the MCI Fiber Grenade to the water before the addition of the cement powder. If on the job site, add the MCI Grenade in the portable mix along with the water prior to the addition of the cement, sand or aggregate. Allow the bag and the powder to dissolve prior to addition of the other components.

DOSAGE

Add to concrete mix, repair mortar or grout at one bag 1.25 lb (0.6kg) per 1/2 cubic yard or one metric bag 1.7 lb (0.8 kg) per 1/2 cubic meter.

PACKAGING

MCI Grenades are packaged 20 bags per box. Regular bag is approximately 10" x 14" (25.4cm x 35.6cm). Metric bag is approximately 12" x 14" (30.5cm x 35.6cm). Please specify if you need metric bags.

TYPICAL PROPERTIES

Appearance	White to off-white powder packed in a PVA bag
Shelf Life	12 months in a sealed box

TEST RESULTS	CONTROL	MCI® FIBERS
Impact Strength, First Crack	7 blows	12 blows
Ultimate Failure	10 blows	17 blows
Modulus of Elasticity	5.26 E +06	5.71 E +06
Residual Strength	54 psi	120 psi
Compressive Strength, 7day	5120 psi	5390 psi
Compressive Strength, 28 day	7000 psi	7090 psi
Flexural Strength, 7 day	610 psi	940 psi
Flexural Strength, 28 day	890 psi	1120 psi
Splitting Tensile Strength	363 psi	441 psi

Toughness Index I_5=4.8, I_{10}=7.7, I_{30}=24.8

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION

Environmentally Safe VpCI™/MCI® Technologies

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

printed on recycled paper 100% post consumer
Revised 1/9/09 . Cortec Corporation 2006-2009

MCI® Fibers

PRODUCT DESCRIPTION

MCI Fibers are mono-filiment polypropylene-based fibers containing Migratory Corrosion Inhibitors (MCI).

MCIs protect reinforcing steel, galvanized steel and other metals embedded in concrete from corrosion induced by carbonation, chloride and atmospheric attack. When incorporated into the concrete mix, MCIs form a corrosion inhibiting, protective layer on metals. When used with repair mortars and grouts, MCIs will migrate toward the rebars, providing effective corrosion protection.

The propylene based MCI Fibers also add mechanical benefits. Shrinkage cracking decreased 66% while residual strength doubled compared to concrete without fibers.

WHERE TO USE

MCI Fibers are recommended for:

- All reinforced, precast, prestressed, post-tensioned or marine concrete structures
- Steel-reinforced concrete bridges, highways and streets exposed to corrosive environments (carbonation, deicing salts and atmospheric attack)
- Parking decks, ramps and garages
- Concrete piers, piles, pillars, pipes and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures

ADVANTAGES

- Shrinkage cracking reduction of 66%, compared to concrete without fibers
- Residual strength doubled, compared to concrete without fibers
- Slow release, long lasting MCI corrosion inhibitors
- Offers engineers, owners, contractors, DOTs and government agencies a time proven corrosion inhibiting technology that will extend the life of reinforced concrete structures
- Protects against the harmful effects of corrosion even in the densest concrete
- Will migrate to adjacent areas to protect surrounding metals
- Required dosage is not affected by chloride concentration
- Does not contain calcium nitrite
- Non-flammable and environmentally friendly
- Concentrated for cost effectiveness on all projects

	Control Concrete without fibers	MCI® Fibers
Impact Strength, First Crack	7 blows	12 blows
Ultimate Failure	10 blows	17 blows
Modulus of Elasticity	5.26 E +06	5.71 E +06
Residual Strength	54 psi	120 psi
Compressive Strength, 7day	5120 psi	5390 psi
Compressive Strength, 28 day	7000 psi	7090 psi
Flexural Strength, 7 day	610 psi	940 psi
Flexural Strength, 28 day	890 psi	1120 psi
Splitting Tensile Strength	363 psi	441 psi
Toughness Index		$I_5 = 4.8$ $I_{10} = 7.7$ $I_{40} = 24.8$

CORTEC CORPORATION
Environmentally Safe VpCI™/ MCI® Technologies

APPLICATION

MCI Fibers can be added to concrete at the ready-mix plant, directly to the ready-mix truck drum or to portable mixers.

DOSAGE

Add to concrete mix, repair mortar or grout at 1 $^{1}/_{2}$ lbs per 1 cubic yard (910 g per 1 cubic meter).

PACKAGING

MCI Fibers are available in 5 lb (2.3 kg) and 50 lbs (23 kg) bags, and 100 lbs (45 kg) drums.

Store in a sealed container in a dry warehouse.

TYPICAL PROPERTIES

Appearance	White to off-white polypropylene-based fibers
Shelf Life	24 months

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Distributed by:

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

printed on recycled paper 10% post consumer
Revised 6/16/06 . Cortec Corporation 2006. All rights reserved. Supersedes: none.

MCI Grenades®, Patented
Metric MCI Grenades®, Patented

PRODUCT DESCRIPTION

MCI Grenades consist of Migrating Corrosion Inhibitors (MCI) packaged in water-soluble PVA bags. MCI Grenades are very convenient to use and come in two sizes for easy dosing. One 500g MCI Grenade per 1 cubic yard or one 650g Metric MCI Grenade per 1 cubic meter provides excellent protection to steel reinforcement.

MCI Grenades dissolve easily when in contact with water in the concrete mix. During mixing the bag will completely dissolve and the MCI compounds will begin to disperse into the mix.

The MCIs protect reinforcing steel, galvanized steel, and other metals embedded in concrete from corrosion induced by carbonation, chloride, and atmospheric attack. When incorporated into the concrete mix, the MCIs form a corrosion inhibiting protective layer on metals. When used with repair mortars and grouts, MCIs will migrate toward the rebars providing effective corrosion protection.

WHERE TO USE

MCI Grenades are recommended for:

- All reinforced, precast, prestressed, post-tensioned, or marine concrete structures
- Steel-reinforced concrete bridges, highways, and streets exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- Parking decks, ramps, and garages
- Concrete piers, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures

ADVANTAGES

- Offers engineers, owners, contractors, DOTs, and government agencies a time proven corrosion inhibiting technology that will extend the life of reinforced concrete structures
- Protects against the harmful effects of corrosion even in the densest concrete
- Does not affect the air entrainment, compressive strength, or the set time of concrete mix
- Required dosage is not affected by chloride concentration
- Does not contain calcium nitrite
- Non-flammable and environmentally friendly
- Lab and field tested
- Concentrated for cost effectiveness on all projects
- Will migrate to adjacent areas to protect surrounding metals

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

APPLICATION

MCI Grenades can be added to concrete at the ready-mix plant, directly to the ready-mix truck drum or to portable mixers. For best results add the MCI Grenades to the mix water before the addition of the cementatious materials. Allow the bag and the powder to dissolve prior to addition of the other components. Continue adding cementatious materials and mix as directed by manufacturer / supplier.

MCI Grenades can be post added to mixing concrete as long as they dissolve and a uniform mix is achieved.

DOSAGE

Add to concrete mix, repair mortar, or grout at one MCI Grenade per 1 cubic yard of concrete mix or one Metric MCI Grenade per 1 cubic meter of concrete mix.

PACKAGING

MCI Grenades are packaged 20 bags (500g each) per box.

Metric MCI Grenades are packaged 20 bags (650g each) per box.

Please specify which size is needed when ordering.

TYPICAL PROPERTIES

Appearance	White to off-white powder packed in a PVA bag
Shelf Life	12 months in a sealed box

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION

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

printed on recycled paper 100% post consumer
Revised 1/6/09 . Cortec Corporation 2000-2009. All rights reserved. Supersedes: 12/01/06 .

Mini MCI Grenades®, Patented

PRODUCT DESCRIPTION

Mini MCI Grenades consist of Migrating Corrosion Inhibitors (MCI®) packaged in water-soluble PVA bags. Mini MCI Grenades are very convenient to use. Mini MCI Grenades are ideal for repair mortars--one Mini Grenade protects 0.4-0.6 ft^3 (0.015 m^3).

The grenade dissolves easily when in contact with water in the concrete mix. During mixing the bag will completely dissolve and the MCI compounds will begin to disperse into the mix.

The MCIs protect reinforcing steel, galvanized steel, and other metals embedded in concrete from corrosion induced by carbonation, chloride, and atmospheric attack. When incorporated into the concrete mix the MCIs form a corrosion inhibiting protective layer on metals. When used with repair mortars and grouts, MCIs will migrate toward the rebars providing effective corrosion protection.

WHERE TO USE

Mini MCI Grenades are recommended for:

- All reinforced, precast, prestressed, post-tensioned, or marine concrete structures
- Steel-reinforced concrete bridges, highways, and streets exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- Parking decks, ramps, and garages
- Concrete piers, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures

ADVANTAGES

- Offers engineers, owners, contractors, DOTs, and government agencies a time proven corrosion inhibiting technology that will extend the life of reinforced concrete structures
- Protects against the harmful effects of corrosion even in the densest concrete
- Does not affect the air entrainment, compressive strength, or the set time of concrete mix
- Required dosage is not affected by chloride concentration
- Does not contain calcium nitrite
- Non-flammable and environmentally friendly
- Lab and field tested
- Concentrated for cost effectiveness on all projects
- Will migrate to adjacent areas to protect surrounding metals
- Cortec logo on each bag ensures MCI inhibitor is inside

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

APPLICATION

Mini MCI Grenades can be added to concrete at the ready-mix plant, directly to the ready-mix truck drum, or to portable mixers. For best results, add the Mini MCI Grenades to the mix water before the addition of the cementatious materials. Allow the bag and the powder to dissolve prior to addition of the other components. Continue adding cementatious materials and mix as directed by manufacturer / supplier.

Mini Grenades can be post added to mixing concrete as long as they dissolve and a uniform mix is achieved.

DOSAGE

Add one Mini Grenade (10 g) per 0.5 ft^3/ 0.015 m^3.

PACKAGING

100 Mini Grenades are packaged per box.

TYPICAL PROPERTIES

Appearance	White to off-white powder packed in a PVA bag
Shelf Life	12 months in a sealed box

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer
Revised 1/9/09 .

MCI®-2000

PRODUCT DESCRIPTION

MCI®-2000 is a liquid concrete admixture; utilizing Migratory Corrosion Inhibitor technology, it protects steel reinforcing, carbon steel, galvanized steel and other metals embedded in concrete. Corrosion induced by carbonation, chloride and atmospheric attack can be prevented with the use of MCI®s. When incorporated into the concrete mix, MCI®-2000 seeks out and forms a corrosion inhibiting layer on the metals. When used with repair mortars and grouts, MCI®-2000 will migrate through undisturbed concrete providing effective corrosion protection to rebars already in place.

WHERE TO USE

MCI®-2000 is recommended for:

- All reinforced, precast, prestressed, post-tensioned or marine concrete structures.
- Steel-reinforced concrete bridges, highways and streets exposed to corrosive environments (carbonation, deicing salts and atmospheric attack).
- Parking decks, ramps and garages.
- All reinforced marine concrete structures.
- Concrete piers, piles, pillars, pipe and utility poles.
- Restoration and repair of all reinforced concrete commercial and civil engineered structures.

ADVANTAGES

- Offers engineers, owners, contractors, DOTs and government agencies a time proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures.
- Protects against the harmful effects of corrosion even in the densest concrete.
- Does not affect the physical properties of the concrete mix (air entrainment, set time, strength or slump).
- Required dosage is not affected by chloride concentration.
- Does not contain any calcium nitrite.
- Organic, safe and environmentally friendly.
- Thoroughly lab and field tested worldwide.
- Concentrated for cost effectiveness on all projects.
- Protects both anodic and cathodic areas.
- Will migrate to adjacent areas to protect surrounding metals.

DOSAGE

Add to concrete mix or repair mortars and grouts at 1 pint per cubic yard (0.6 liter/cubic meter).

APPLICATION

MCI®-2000 can be added to concrete at the ready-mix plant, directly to the ready-mix truck drum, to portable mixers or directly into repair mortars. Mix concrete and mortars thoroughly.

TYPICAL-PROPERTIES

Appearance	Clear yellow-green to green liquid
Density	7.4 - 7.7 lb/gal (0.89 - 0.93 kg/l)
pH	10 - 11 (neat)
Flash Point	103°F T.C.C (39°C)
	115°F T.O.C. (46°C)
Shelf Life	24 months in a sealed drum

PACKAGING AND STORAGE

Product is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes and bulk. Store containers below 100°F (38°C) and away from heat or open flame.

CORTEC CORPORATION
Environmentally Safe VCI/MCI® Technologies

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 10% post consumer

MCI®-2001

PRODUCT DESCRIPTION

MCI®-2001 is a powdered form of MCI®-2000. It is a Migrating Corrosion Inhibitor (MCI®) concrete admixture that protects steel reinforcing, carbon steel, galvanized steel and other metals embedded in concrete from corrosion induced by carbonation, chloride and atmospheric attack. When incorporated into the concrete mix, MCI®-2001 seeks out and forms a corrosion inhibiting protective layer on metals. When used with repair mortars and grouts, MCI®-2001 will migrate to undisturbed concrete, providing effective corrosion protection to reinforcement already in place.

WHERE TO USE

MCI®-2001 is recommended for:

- All reinforced, precast, prestressed, post-tensioned or marine concrete structures
- Steel-reinforced concrete bridges, highways and streets exposed to corrosive environments (carbonation, deicing salts and atmospheric attack)
- Parking decks, ramps and garages
- Concrete piers, piles, pillars, pipes and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures

ADVANTAGES

- Offers engineers, owners, contractors, DOTs and government agencies a time-proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures
- Protects against the harmful effects of corrosion even in the densest concrete
- Does not effect the physical properties of the concrete mix (air entrainment, set time, strength or slump)
- Required dosage is not effected by chloride concentration
- Does not contain calcium nitrite
- Organic, safe and environmentally friendly
- Thoroughly lab and field tested worldwide
- Concentrated for cost effectiveness on all projects
- Protects both anodic and cathodic areas
- Will migrate to adjacent areas to protect surrounding metals

DOSAGE

Add to concrete mix or repair mortars and grouts at 1.5 lb/yd^3 (0.90 kg/m^3).

APPLICATION

MCI®-2001 can be added to concrete at the ready-mix plant, directly to the ready-mix truck drum, to portable mixers or directly into repair mortars. Mix concrete and mortars thoroughly.

TYPICAL PROPERTIES

Appearance	White to green powder
pH	10.5-11.3 (10% water)
Non-volatile Content	45-55%
Flash Point	TCC 103ºF (39ºC)
	TOC 115ºF (46ºC)
Shelf Life	24 months in a sealed drum

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

PACKAGING AND STORAGE

MCI®-2001 is available in 5 lb (2.3 kg) boxes, 50 lb (23kg) and 100 lb (45 kg) drums. Keep containers tightly closed and away from heat.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 10% post consumer
Revised 11/06/06. Cortec Corporation 2000-2006. All rights reserved. Supersedes: 1/30/06

MCI®-2005 Patented

USDA CERTIFIED BIOBASED PRODUCT
PRODUCT 67%

CLASSIFIED UL EPH

CLASSIFIED UL WATER QUALITY

Drinking Water System Component ANSI/NSF 61 36AL

PRODUCT DESCRIPTION

MCI-2005 is a water-based, organic, corrosion inhibiting admixture for the protection of metallic reinforcement in concrete structures.

When incorporated into concrete, MCI-2005 migrates towards reinforcement. Once there, it forms a monomolecular layer that inhibits the corrosion reaction on both anodic and cathodic components of the corrosion cell.

This effect can be quantified by the increased critical chloride threshold and subsequent reduction in corrosion rate.

MCI -2005 has been awarded USA BioPreferred[SM] designation (www.biopreferred.gov)

HOW IT WORKS

MCI-2005 is an organic corrosion inhibitor. It is considered ambiotic (mixed) meaning it protects both anodic and cathodic areas within a corrosion cell. MCI-2005 contains a blend of aminoalcohols salts of carboxylic acids which form a protective layer on embedded reinforcement delaying the onset of corrosion as well as reducing existing corrosion rates.

MCI-2005 is effective at enhancing the durability and extending the service life of concrete structures exposed to corrosive environments (carbonation, chlorides, and atmospheric attack).

WHERE TO USE

MCI-2005 is recommended for:

- All reinforced concrete including precast, pre-stressed, and post-tensioned structures
- Corrosive environments including exposure to deicing salts, saline groundwater, airborne chlorides, and carbonation
- Marine and coastal structures, highways and bridges, parking decks, pilings, substructures, piers, pillars, pipes, and utility poles

ADVANTAGES

- Biobased (67%), safe and environmentally friendly - earning LEED credits to user
- Migrates through concrete towards reinforcement by capillary action, vapor diffusion, and ionic attraction
- Low dosage with minimal effect on concrete properties (i.e. workability, strength development)
- NSF Standard 61 approved for use in potable water tanks (certified by Underwriters Laboratories)
- Field and lab tested worldwide
- Effective for the prevention of macro-cell corrosion where cathodic and anodic sites exist in different environments.
- Meets requirements for ASTM C1582

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

PHYSICAL PROPERTIES

Appearance:	Clear dark brown liquid
Non-Volatile Content:	44-55%
Density:	9.5-10.3 lb/gal (1.14-1.23 Kg/L)
pH:	9.5-11.5 (neat)
Shelf Life:	24 months

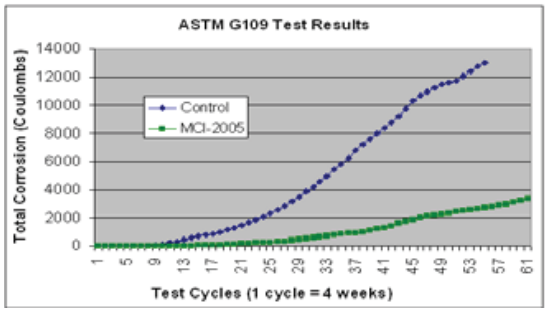
DOSAGE

Add MCI-2005 to concrete mix or repair mortars at 1 pt/yd^3 (0.6 L/m^3). Dosage is fixed and independent of chloride levels.

PACKAGING

Available in 5-gallon (19 Liter) pails, 55-gallon (208 Liter) drums, and 275-gallon (1040 Liter) totes

PERFORMANCE DATA



ASTM G109 - Standard Test Method for Determining Effects of Chemical Admixtures on Corrosion of Embedded Steel Reinforcement in Concrete Exposed to Chloride Environments

MCI-2005 doubles the time to the onset of corrosion and reduces corrosion currents by 80% compared to untreated samples.

APPLICATION

MCI-2005 must be added to the concrete mix at the batching plant and mixed thoroughly prior to loading into ready-mix truck drum. It should be added along with the mix water. It should not be added directly to the cement.

MCI-2005 may be used with all types of Portland Cements and mineral admixtures. It is compatible with water reducing, accelerating, air-entraining admixtures, and most superplasticizers.

ASTM C1582 PHYSICAL PROPERTIES DATA FOR MCI-2005		
	Control	MCI-2005
Initial Set (Minutes)	312	431
Final Set	404	524
Length Change (%)	-0.025	-0.021
Freeze/Thaw Durability (%)	99.1	98.8

Compresseve Strength (Pounds per Square Inch)

3 Day	3290	3647
7 Day	4070	4377
28 Day	5143	5330
6 Month	6607	6650
1 Year	6463	6877

Flexural Strength (Pounds per Square Inch)

3 Day	585	591
7 Day	661	691
28 Day	757	797

CONSIDERATIONS

The use of MCI-2005 can cause a delay of initial setting time. The extent of the delay is dependent on the mix design, temperature, and humidity. Properties are always best determined in a trial mix using the actual mix components.

The combination of MCI-2005 with some superplasticizers can cause a set delay.

Consult with Cortec's Technical Support Department for guidance on optimizing your mix design.

STORAGE AND HANDLING

Store away from direct sunlight and at ambient temperatures above freezing and up to 55°C (131°F).

When properly stored, MCI-2005 has a shelf life of 24 months. DO NOT allow product to freeze.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

CORTEC CORPORATION

Environmentally Safe VpCI®/MCI® Technologies

Distributed by:

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

printed on recycled paper 100% post consumer

MCI®-2005 AL

PRODUCT DESCRIPTION
MCI®-2005 AL is a liquid concrete admixture that protects steel reinforcing, carbon steel, galvanized steel and other metals embedded in concrete from corrosion induced by carbonation, chloride and atmospheric attack. MCI®-2005 AL protects by a time-proven migratory corrosion inhibitor function. In addition, it contains a proven contact inhibitor. When incorporated into the concrete mix, Migrating Corrosion Inhibitors (MCI®) seek out and form a corrosion inhibiting protective layer on metals. When used with repair mortars and grouts, MCI®-2005 AL will migrate to undisturbed concrete providing effective corrosion protection to rebar already in place.

FEATURES
MCI®-2005 AL offers engineers, owners, contractors, DOTs and government agencies a time-proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures.

- Protects against the harmful effects of corrosion in different types of concrete
- Required dosage is not affected by the chloride concentration
- Does not contain calcium nitrite
- Non-hazardous and non-toxic
- Safe and environmentally friendly
- Technology is lab and field proven worldwide
- Concentrated for cost effectiveness on all projects
- Protects both anodic and cathodic areas
- Will migrate to adjacent areas to protect metals

TYPICAL USES
MCI®-2005 AL is recommended for:

- All reinforced, precast, prestressed, post-tensioned or marine concrete structures
- Steel-reinforced concrete bridges, highways and streets exposed to corrosive environments (carbonation, deicing salts and atmospheric attack)
- Parking decks, ramps and garages
- All reinforced marine concrete structures
- Concrete piers, piles, pillars, pipes and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures
- Can be added either to the water or powder on-site for shotcreting applications
- Can be added into a manufacturer's repair mortar formulation to enhance its corrosion protection ability
- NSF Standard 61 approved for potable water applications (certified by Underwriters Laboratories)

MCI®-2005 AL should be used when there are freezing or very high temperatures expected during storage, and also in the projects where the presence of sodium should be minimized.

DOSAGE
Add MCI®-2005 AL to concrete mix at the rate of 1.5 pts/yd^3 (1l/m^3).

CORTEC CORPORATION
Environmentally Safe VCI/MCI® Technologies

APPLICATION

MCI®-2005 AL can be added to the mix water or to concrete powder at the ready-mix plant, directly into a ready-mix truck drum or in portable mixers. Concrete should be mixed thoroughly.

TYPICAL PROPERTIES

Appearance	Yellow to amber liquid
pH	9-10 (1% solution)
Non-volatile Content	30-35%
Density	9.2-9.3 lb/gal (1.10-1.11 kg/l)

PACKAGING AND STORAGE

MCI®-2005 AL is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes and bulk. The shelf life is 24 months in a sealed container. Do not allow product to freeze.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Distributed by:

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

MCI®-2005 NS

PRODUCT DESCRIPTION
MCI®-2005 NS (normal set) is a liquid concrete admixture that protects steel reinforcing, carbon steel, galvanized steel and other metals embedded in concrete from corrosion induced by carbonation, chloride and atmospheric attack without changing the set time of most concrete mixes. MCI®-2005 NS protects by a time-proven migratory corrosion inhibitor function. In addition, it contains a proven contact inhibitor. When incorporated into the concrete mix, Migrating Corrosion Inhibitors (MCI®) seek out and form a corrosion inhibiting protective layer on metals. When used with repair mortars and grouts, MCI®-2005 NS will migrate to undisturbed concrete providing effective corrosion protection to rebar already in place.

FEATURES
MCI®-2005 NS offers engineers, owners, contractors, DOTs and government agencies a time-proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures.

- Protects against the harmful effects of corrosion in different types of concrete
- Required dosage is not affected by the chloride concentration
- Does not contain calcium nitrite
- Non-hazardous and non-toxic
- Safe and environmentally friendly
- Technology is lab and field proven worldwide
- Concentrated for cost effectiveness on all projects
- Protects both anodic and cathodic areas
- Will migrate to adjacent areas to protect metals

TYPICAL USES
MCI®-2005 NS is recommended for:

- All reinforced, precast, prestressed, post-tensioned or marine concrete structures
- Steel-reinforced concrete bridges, highways and streets exposed to corrosive environments (carbonation, deicing salts and atmospheric attack)
- Parking decks, ramps and garages
- All reinforced marine concrete structures
- Concrete piers, piles, pillars, pipes and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures
- Can be added either to the water or powder on-site for shotcreting applications
- Can be added into a manufacturer's repair mortar formulation to enhance its corrosion protection ability
- NSF Standard 61 approved for potable water applications (certified by Underwriters Laboratories)

DOSAGE
Add MCI®-2005 NS to concrete mix at the rate of 1.5 pts/yd^3 (1l/m^3).

APPLICATION
MCI®-2005 NS can be added to the mix water or to concrete powder at the ready-mix plant, directly into a ready-mix truck drum or in portable mixers. Concrete should be mixed thoroughly.

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

TYPICAL PROPERTIES

Appearance	Dark brown liquid
pH	11-12 (1% solution)
Non-volatile Content	25-30%
Density	9.9-10 lb/gal (1.19-1.20 kg/l)

PACKAGING AND STORAGE

MCI®-2005 NS is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes and bulk. The shelf life is 24 months in a sealed container. Do not allow product to freeze.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 10/12/06. Supersedes: 8/25/03.

MCI®-2006

PRODUCT DESCRIPTION

MCI®-2006 is a powder concrete admixture that protects steel reinforcing, carbon steel, galvanized steel and other metals embedded in concrete from corrosion induced by carbonation, chloride and atmospheric attack. MCI®-2006 protects with a time proven migratory inhibitor function. In addition, it contains a proven contact inhibitor. When incorporated into the concrete mix, Migrating Corrosion Inhibitors (MCI®) seek out and form a corrosion inhibiting protective layer on metals. When used with repair mortars and grouts, MCI®-2006 will migrate to undisturbed concrete providing effective corrosion protection to rebar already in place.

WHERE TO USE

MCI®-2006 is recommended for:

- All reinforced, precast, prestressed, post tensioned or marine concrete structures.
- Steel-reinforced concrete bridges, highways and streets exposed to corrosive environments (carbonation, deicing salts and atmospheric attack).
- Parking decks, ramps and garages.
- All reinforced marine concrete structures.
- Concrete piers, piles, pillars, pipe and utility poles.
- Restoration and repair of all reinforced concrete commercial and civil engineered structures.

ADVANTAGES

MCI®-2006 offers engineers, owners, contractors, DOTs and government agencies a time proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures.

- Protects against the harmful effects of corrosion even in the densest concrete.
- Reduces the chloride ingress.
- Does not contain any calcium nitrite.
- Non-hazardous and non-toxic.
- Non-flammable.
- Organic, safe and environmentally friendly.
- Technology is lab and field tested worldwide.
- Concentrated for cost effectiveness on all projects.
- Protects both anodic and cathodic areas.
- Will migrate to adjacent areas to protect surrounding metals.
- NSF Standard 61 approved for potable water applications (certified by Underwriters Laboratories).

TYPICAL PROPERTIES

Appearance	White to off-white powder
pH	5.5-6.5 (1% aqueous)

DOSAGE

Added to the concrete mix at the rate of 1 pound per cubic yard (0.6 kg/cubic meter).

APPLICATION

MCI®-2006 can be added to concrete at the ready-mix plant, directly to the ready-mix truck drum or to portable mixers. Concrete should be mixed thoroughly.

LIMITATIONS

MCI®-2006 will act as a retarding admixture. It retards setting time up to four hours compared to a control. A non-chloride accelerator may be used to offset retardation.

PACKAGING AND STORAGE

MCI®-2006 is available in 5 lbs. (2.3 kg), 50 lbs. (22.7 kg), and 100 lbs. (45.3 kg) packages. Store product in a cool dry place. Shelf life is 24 months in sealed container.

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION

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

printed on recycled paper 100% post consumer

MCI®-2006 NS

PRODUCT DESCRIPTION

MCI-2006 NS (normal set) is a powder concrete admixture that protects steel reinforcing, carbon steel, galvanized steel, and other metals embedded in concrete from corrosion induced by carbonation, chloride, and atmospheric attack without changing the set time of most concrete mixes. MCI-2006 NS protects using a time proven migratory corrosion inhibitor function. In addition, it contains a proven contact inhibitor. When incorporated into the concrete mix, Migrating Corrosion Inhibitors (MCI) seek out and form a corrosion inhibiting, protective layer on metals. When used with repair mortars and grouts, MCI-2006 NS will migrate to undisturbed concrete providing effective corrosion protection to rebar already in place.

FEATURES

MCI-2006 NS offers engineers, owners, contractors, DOTs, and government agencies a time-proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures.

- Protects against the harmful effects of corrosion even in the densest concrete
- Dosage rate is independent of expected chloride concentration
- Does not contain any nitrites
- Non-hazardous and non-toxic
- Safe and environmentally friendly
- Technology is lab and field tested worldwide
- Concentrated for cost effectiveness on all projects
- Protects both anodic and cathodic areas
- Will migrate to adjacent areas to protect surrounding metals
- NSF Standard 61 approved for potable water applications (certified by Underwriters Laboratories)

TYPICAL USES

MCI-2006 NS is recommended for:

- All reinforced, precast, prestressed, post-tensioned, or marine concrete structures
- Steel-reinforced concrete bridges, highways, and streets exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- Parking decks, ramps, and garages
- All reinforced marine concrete structures
- Concrete piers, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures
- Can be added either to the water or powder on-site for shotcreting applications
- Can be added into a manufacturer's repair mortar formulation to enhance its corrosion protection ability

DOSAGE

Add MCI-2006 NS to the concrete mix at a rate of 1 lb/yd^3 (0.6 kg/m^3).

APPLICATION

MCI-2006 NS can be added to concrete powder at the ready-mix plant, directly into in a ready-mix truck drum or portable mixers. Concrete should be mixed thoroughly.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

TYPICAL PROPERTIES

Appearance	Off-white powder
pH	11.5-13.0 (1% solution)
Non-volatile Content	99.5-100%

PACKAGING AND STORAGE

MCI-2006 NS is available in 5 lb (2.3 kg), 50 lb (22.7 kg), and 100 lb (45.4 kg) packages. The shelf life of the product is 24 months in a sealed drum.

ASTM C494 Data For MCI-2006 NS

	Control	MCI 2006 NS
Inital Set (Minutes)	304	365
Final Set (Minutes)	394	457
Length Change (%)	-0.022	-0.023
Freeze/Thanw Durabitlity (%)	98.3	98.8

Compressive Strength
(Pounds per Square Inch)

	Control	MCI 2006 NS
3 Day	3263	3357
7 Day	4027	4173
28 Day	5057	5163
6 Month	5813	6177
1 Year	6430	6767

Flexural Strength
(Pounds per Square Inch)

	Control	MCI 2006 NS
3 Day	607	586
7 Day	663	651
28 Day	768	734

Based on ASTM C 494 data within report #09145 from Tourney Consulting Group.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 6/30/11. Cortec Corporation 1998-2011. Supersedes: 10/12/06.

MCI®-2007 Liquid Super Corr®
MCI®-2007 Powder Super Corr®

Patented
Corrosion Inhibiting Superplasticizer for Concrete

PRODUCT DESCRIPTION

MCI-2007 Liquid and MCI-2007 Powder are admixtures with Cortec's exclusive Migratory Corrosion Inhibitor technology. They are recommended for use in all concrete, especially reinforced, prestressed, and post-tensioned concrete. MCI-2007 Liquid and MCI-2007 Powder are water reducing compounds. They reduce mixing water by 20-30% depending on cement type and protect reinforcing such as carbon steel, galvanized steel, and other metals embedded in concrete from corrosion induced by carbonation, chloride and atmospheric attack. When incorporated into the concrete mix, MCI-2007 Liquid and MCI-2007 Powder seek out and form a corrosion inhibiting, protective layer on embeded metals. When used with repair mortars and grouts, MCI-2007 Liquid and MCI-2007 Powder will migrate to undisturbed concrete, providing effective corrosion protection to rebar already in place.

WHERE TO USE

MCI-2007 Liquid and MCI-2007 Powder are recommended for:

- All reinforced, precast, prestressed, and post-tensioned concrete structures
- Steel-reinforced concrete bridges, highways, roads, and buildings exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- Parking garages
- All reinforced marine concrete structures
- Concrete piers, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete

ADVANTAGES

MCI-2007 Liquid and MCI-2007 Powder offer engineers, owners, contractors, DOTs, and government agencies a time proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures.

- Protects against the harmful effects of corrosion even in the densest concrete
- Significantly improves the concrete's plastic and hardened properties
- Ideal to produce flowing concrete where rapid placing is required or in very congested zones
- Increases compressive strength 20-40%, depending on overall mix design
- Increases flexural strength 10-20%, depending on overall mix design
- Significantly reduces gas permeability
- Does not effect air entrainment
- Dosages are not effected by chloride concentration

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

- Reduces the water content while keeping good workability properties
- Does not contain any nitrite-based compounds
- Organic-based; safe and environmentally friendly
- MCI technology is thoroughly lab and field tested worldwide
- Protects both anodic and cathodic areas
- Migrates to adjacent areas to protect surrounding metals
- MCI-2007 Liquid Super Corr meets ASTM C 494 Type G high range water reducing/retarding admixture requirements
- MCI-2007 Powder Super Corr meets ASTM C 494 Type F high range water reducing admixture

TYPICAL PROPERTIES

	MCI-2007 Liquid	MCI-2007 Powder
Appearance	Dark Brown Liquid	Yellowish Powder
pH (1% aqueous)	8.5-9.5	11.5-12.5
Non-volatile Content	47-55%	95-100%
WPG	10.2-10.3 lb/gal (1.22-1.23 kg/l)	
Chemical Base	Melamine + Amine Carboxylate	Polycarboxylate + Amine Carboxylate

DOSAGE

Excellent results are obtained using 11-14 oz./100 lb (7-10 mL/kg) of MCI-2007 Liquid Super Corr™ based on cement in concrete mix (3-4 pints per cubic yard or 1.5-2.0 l/m^3 of concrete).

MCI-2007 Powder Super Corr should be used at 3.5- 6 oz/100 lb (2.2-3.7g/kg) based on cement in concrete mix (16-27 oz per cubic yard or 0.6-1.0 kg/m^3 of concrete).

PACKAGING

MCI-2007 Liquid Super Corr is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes, and bulk.

MCI-2007 Powder Super Corr is available in 5 lbs (2.3 kg), 50 lbs (23 kg), and 100 lbs (45 kg) packages.

ASTM C 494 Water Reducttion Results

Admix	Dosage Rate (oz/100lbs)	Non Air Entrained (% water content relative to control)	Air Entrained (% water content relative to control)	Required % water control relative to control
MCI - 2007 Liquid	11.9	86	88	≤ 88
MCI - 2007 Powder	3.5	87	86	≤88

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Distributed by:

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

MCI®-2008 Via Corr, Patented
MCI®-2008 L Via Corr, Patented

Migrating Corrosion Inhibitor and Self-Leveling Viscosity Modifier for Concrete

PRODUCT DESCRIPTION

MCI-2008 is a concrete admixture in powder form which combines Cortec's exclusive Migratory Corrosion Inhibition technology with a polycarboxylate based, superplastisizing, viscosity modifier. An effective migratory corrosion inhibitor for metal reinforcement, MCI-2008 also provides self-compacting, self-leveling, and self-placing properties to concrete. This exceptional performance is achieved with special ingredients possessing electrostatic and steric flowability and workability control.

MCI-2008 protects carbon steel, galvanized steel, and other metals embedded in concrete from corrosion induced by carbonation, chloride and atmospheric attack. When incorporated into the concrete mix, MCI-2008 seeks out and forms a corrosion inhibiting protective layer on metals. When used with repair mortars and grouts, MCI-2008 will migrate to undisturbed concrete, providing effective corrosion protection to rebar already in place.

MCI-2008 is also available in liquid form (MCI-2008 L).

WHERE TO USE

MCI- 2008 is recommended as an additive for self-leveling concrete used in:

- All reinforced, precast, prestressed, and post-tensioned concrete structures
- Steel-reinforced concrete bridges, highways, roads, and buildings exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- All reinforced marine concrete structures
- Concrete piers, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete
- Self-leveling underlayments
- Architectural concrete
- Specialty shaped concrete slabs

ADVANTAGES

MCI-2008 offers engineers, owners, contractors, DOTs, and government agencies a time proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures.

- Reduced construction time
- Reduced manpower for placing and compacting
- Lower equipment cost
- Ability to fill complex forms and members with congested reinforcement
- Elimination of rubbing and patching ordinarily required to fill defects in poorly consolidated surfaces
- Excellent flowability and workability
- Protects against the harmful effects of corrosion
- Significantly improves the concrete's plastic and hardened properties
- Is ideal to produce flowing concrete where rapid placing is required or in very congested zones
- Significantly reduces gas permeability
- Dosage is not affected by chloride concentration
- Reduces the water content while keeping good workability properties
- Does not contain any nitrite-based compounds
- Is organic-based, safe, and environmentally friendly

CORTEC CORPORATION
Environmentally Safe VpCI® MCI® Technologies

TYPICAL PROPERTIES

Properties	MCI-2008 ViaCorr Powder	MCI-2008 Liquid
Chemical Nature	Blend of salts of carboxylic acids	
Appearance	Yellowish powder	Yellowish to amber liquid
Bulk density, g/100 cm^3	30-50	
pH of 1% aqueous solution @ 20C	7.0 to 9.0	7.0-8.0
Density		9.0-10.0 lb/gal (1.08-1.20 kg/l)
Non-volatile (weight)	90-100%	40-55%

	Flow, mm				
Material	5 min	15 min	30 min	45 min	60 min
MCI-2008	200	190	190	185	180
Competitor	157	153	154	148	140
	Knife Cut Test (Self-healing properties), Grade				
Material	7 min	15 min	30 min	45 min	60 min
MCI-2008	1	1	1	1-2	2
Competitor	1	1	2	2	3

Grades:
1 – Cut heals completely, invisible
2 – Cut heals, but visible
3 – Cut heals, but visible edges
4 – Cut heals, but well visible edges
5 – Cut heals, but visible scar
6 – Cut heals, but well visible scar
7 – Cut does not heal

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

APPLICATION OF POWDER

Blend thoroughly with the other dry ingredients at a dosage rate of 0.4 % to 0.6 %, by total weight of dry ingredients of 0.3mm sieve size or smaller.

APPLICATION OF LIQUID

Post add with at least 80% of water already in the mixer at a dosage rate of 0.3-0.5% by total weight of cement and other dry ingredients of 0.3mm sieve size or smaller.

To achieve maximum self-compacting, self-leveling and self-placing properties with either product, use more fines in the mix design. For example:

Ingredient	% range by weight
MCI-2008	0.3-0.5
Water	18-23
Coarse aggregate	25-30
Sand	30-35
Fines, including portland cement and quartz sand up to 0.3mm in diameter	16-20

PACKAGING AND STORAGE

MCI®-2008 is available in 50 Lbs (23 Kg) and 100 Lbs (45 Kg) packages. MCI®-2008 L is available in 5 gallon (19 L) and 55 gallon (208 L) drums. The shelf life of the product is 12 months in a sealed drum.

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 products 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 THEREWITH. 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.

Distributed by:

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

Printed on recycled paper 100% post consumer
Revised 3/24/08. Cortec Corporation 2003-2008. All rights reserved. Supersedes: 11/16/07.

8.2
Concrete Repair & Restoration

MCI® Architectural Coating

PRODUCT DESCRIPTION

MCI Architectural Coating is a unique, water-based primer/topcoat designed to provide protection in harsh, outdoor applications. MCI Architectural Coating provides three main benefits:

- acts as a sealer, preventing penetration of water, chloride ingress, and carbonation of the concrete
- improves the appearance of buildings and structural elements when applied
- provides a source of corrosion inhibitors when applied directly to reinforcement and/or metal

MCI Architectural Coating is superior to many coatings containing inorganic pigments because its resistance has been improved by replacing pigments and metal oxides with more effective corrosion inhibitors. The special combination of additives provides a composite polymer barrier that significantly prolongs the service life of reinforced concrete, protecting both concrete and reinforcement from corrosive electrolytes and aggressive environments.

MCI Architectural Coating is a fast drying, thrixotropic coating that is resistant to sagging and running. It forms a tough, non-flammable, protective barrier that is thermally stable (-40°F to +400°F or -40°C to 204°C) once cured. MCI Architectural Coating is resistant to ultraviolet radiation. It provides optimal outdoor performance without cracking or chipping upon prolonged exposure to sunlight. MCI Architectural Coating is a clear coating that allows visual inspection of the surface after application, but can be easily tinted with pigment dispersions. Custom colors are available.

FEATURES

- Contains Migratory Corrosion Inhibitors
- UV resistant when cured
- Fast-drying
- Forms non-flammable, protective barrier
- Optimal outdoor performance
- Available in custom colors
- Has excellent adhesion to concrete, masonry, plastic, etc.
- Protects steel, aluminum, galvanized steel, stainless steel, copper, etc.

WHERE TO USE

- All reinforced, precast, prestressed, post-tensioned, or marine concrete structures
- Concrete piers, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures

ADVANTAGES

- MCI Architectural Coating offers engineers, owners, contractors, DOTs, and government agencies a time proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures
- Easily applied by spray, roller, squeegee, or paint brush to any concrete surface, reducing the high cost of labor and equipment
- Non-toxic, water-based, and non-flammable
- Safe and environmentally friendly
- Enhances the durability of reinforced concrete and increases surface abrasion resistance
- Blocks carbonation and chloride ion intrusion
- Resistant to alkali attack

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

SURFACE PREPARATION

Surface should be dry, sound, clean, and free of all dirt, oil, grease efflorescence, sealers, coatings, membranes, and asphalt. Cleaning may be done by steam cleaning, waterblasting, or sandblasting.

Note: For additional corrosion protection MCI-2020 or MCI-2020 M can be applied prior to coating. See product data sheet application instructions.

APPLICATION

Do not alter or dilute the material. Do not use on wet or damp substrates. Power agitate to a uniform consistency using a "squirrel cage" type mixer, hand held drill, or other equivalent method.

Apply 4-7.5 mils (100-187.5 microns) wet film thickness via spray, brush or roller.

Conventional Spray

Manufacturer	Gun Model	Tip/Aircap Combination
DeVilbiss	MBC or JGA	704E
Binks	#18 or # 62	66PE

Fluid hose should be 3/8" (0.95 cm) I.D. with a maximum length of 50 feet (15.2 m). Pot should always have dual regulation and be kept at same elevation as spray gun.

Airless

Manufacturer	Gun Model	Tip/Aircap Combination
Graco	205-591	Bulldog
Binks	Model 500	Mercury 5C
DeVilbiss	JGN-501	QFA-519

Hose should be 3/8" (0.95 cm) I.D. minimum, but a 1/4" (0.64 cm) I.D. whip end section may be used for ease of application. A maximum length of 100 feet (30.5 m) is suggested. Best results will be obtained using a 0.013"-0.017" (0.3-0.4 cm) tip at 1200-1700 psi (83-117 bar).

Note: Nylon or Teflon type packings are available from pump manufacturer and are highly recommended.

Note: Similar equipment may be suitable

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

APPLICATION CONSIDERATIONS

The substrate and ambient temperature should be above freezing and below 125°F (50°C). Do not apply if the temperature is expected to fall below freezing within 12 hours. Dewpoint should be more than 5°F (2°C) less than air temp for application.

For new concrete, apply MCI Architectural Coating after the concrete has cured to a minimum of 14 days. For optimum results, allow concrete to cure 28 days or longer.

TEST DATA

MCI Architectural Coating decreases the corrosion rate of metal reinforcement caused by chlorides by four-fold, based on Cortec® Project #00-285-4431. When applied to SAE 1010 carbon steel it protects 168 hours in salt spray chamber (ASTM B-117) and over 1000 hours in humidity chamber (ASTM D-1748). When applied to aluminum, it protects over 1000 hours in both salt spray and humidity chambers at 2 mil DFT.

PACKAGING AND STORAGE

MCI Architectural Coating is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) metal drums, liquid totes, and bulk. Keep product from freezing.

TYPICAL PROPERTIES

Appearance	Liquid, various colors
pH	8.3-9.0 (Neat)*
Density	8.0-10.5 lb/gal* (0.96-1.26 kg/l)*
Non-volatile Content	35-50%*
Dry Film Thickness (per coat)	1.5-3.0 mils (37.5-75 microns)
Theoretical Spread Rate	535-641 ft^2/gal (13-16 m^2/l)*
Dry to Touch Time	30 minutes @ 77°F (25°C) at 2 mils
Fully Cured	7 days@ 77°F (25°C), 55% RH
Temperature Stability	45°-90°F (7°-32°C)
VOC (ASTM D-3960)	1.5-1.7 lb/gal (203 g/l)*
Viscosity	700-3,000 cps (6 rpm/#2)**

*varies per color
**varies per customer request

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer
Revised 1/14/09. Cortec Corporation 2001-2009. All rights reserved. Supersedes: 8/13/07.

USDA CERTIFIED BIOBASED PRODUCT
PRODUCT 62%

MCI® CorteCure®

PRODUCT DESCRIPTION

MCI CorteCure is a water-based, membrane-forming, curing compound that contains Migrating Corrosion Inhibitor (MCI). It is made of biobased renewable materials.

It is designed to:

- Retain the hydration water in freshly worked concrete to aid in proper curing and a stronger concrete
- Be easily removed after UV weathering and traffic after 4-8 weeks (depending on exposure)
- Be VOC compliant per European and California regulations

WHERE TO USE

MCI CorteCure is recommended for all newly-worked concrete to provide a convenient and excellent initial cure for:

- All reinforced, precast, prestressed, post-tensioned,or marine concrete structures
- Steel-reinforced concrete bridges, highways, and streets exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- Parking decks, ramps, and garages
- Concrete piers, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures
- Buildings and foundations of all types
- Cooling towers and water tanks

ADVANTAGES

- Enhances durability of reinforced concrete
- Ensures proper curing of fresh set concrete
- Removable after initial curing of the concrete, initial cure is in 4-8 weeks depending on weather and traffic exposure
- Cured concrete surfaces are able to receive subsequent treatment such as tiling, paint, and sealers after removal of MCI CorteCure
- Water-based and non-flammable for easy handling
- Safe and environmentally friendly
- Easily applied by spray, roller, squeegee, or paint brush to concrete surfaces
- Contains a fugitive dye

APPLICATION

MCI CorteCure should be applied to freshly worked concrete after surface water glaze has disappeared and surface will not be marred by walking workman (generally about 4 hrs depending on concrete mixture used and application conditions). Do not apply when material or surface is below 40°F (4.5°C).

Stir gently before use. Apply at a rate of 200-250 ft^2 /gal (4.9 - 6.1 m^2/L). Apply solution by spray (conventional airless or hand pressure spray equipment), roller, squeegee, or paint brush to concrete surface.

MCI CorteCure is removable so that the concrete surface can receive subsequent treatment. MCI CorteCure is degradable and will flake off after 4-8 weeks exposure to UV and traffic abrasions. If any coating material remains, it can be removed by a stiff brush and water, or by a pressure wash.

Application tools should be cleaned with soapy water while still wet.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

TYPICAL PROPERTIES

Appearance	Milky pink liquid
pH	9.3-10.5 (neat)
Density/Specific gravity	8.3-8.4 lb/gal (1.0-1.01 kg/l)
Non-volatile Content	25-27%
Storage	DO NOT FREEZE Minimum >41°F (>5°C) Maximum <95°F (<35°C)
VOC (regulatory)	144 g/L
Shelf life	up to 6 months in a sealed drum

ASTM C-309 Compliant (water loss <0.5 kg/m^2 in 72 hours, at a rate of 200-250 ft^2/gal)

(Specification for Liquid Membrane-Forming Compounds for Curing Concrete)

PACKAGING

MCI CorteCure is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes, and bulk.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Distributed by:

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

printed on recycled paper 100% post consumer

MCI® POWR

Penetrating, Oil and Water Repellant

DESCRIPTION

MCI POWR is a penetrating, water-based, alkylalkoxy silane containing Cortec's migrating corrosion inhibitor technology. MCI POWR is specifically designed to protect new and existing concrete structures against the damaging effects of moisture intrusion, freeze/thaw scaling, chloride-ion (salt) intrusion, and oil and water staining.

HOW IT WORKS

MCI POWR penetrates the concrete and provides water repellency by chemically reacting with the cementitious substrate under proper application. Treated substrates are hydrophobic and retain their original appearance.

Once applied, MCI POWR not only provides water repellency, but protects concrete from oil and water staining. Its Migratory Corrosion Inhibitor action allows this product to penetrate to embedded reinforcement where it forms a protective, monomolecular, corrosion inhibiting layer.

WHERE TO USE

- Bridges
- Floors Exposed to Oils/Grease/Water (Automotive Service Centers, Commercial Kitchens, etc.)
- Highways
- Parking Decks

ADVANTAGES

MCI POWR offers engineers, owners, contractors, DOTs, and government agencies a time proven, corrosion inhibiting technology that will extend the life of all reinforced concrete structures.

- Oil and water resistant within 24 hours
- Synergistic corrosion protection – seals surface and penetrates to embedded reinforcement
- MCI® molecules reduce further corrosion of rusted metals
- Easily applied by spray, brush, roller, or squeegee
- Non-toxic, contains no nitrites, phosphates, or chromates
- Small molecule size allows for deep penetration in concrete and other cementitious substrates
- Increases surface abrasion resistance
- Blocks carbonation and chloride ion intrusion
- Resistant to alkali attack
- Helps protect against acid and chemical attack
- Allows concrete to breathe; is not a vapor barrier
- No blushing, peeling, or yellowing

PHYSICAL PROPERTIES

Appearance	Milky White Liquid
pH	9.9-10.1 (neat)
Density	7.8-8.1 lb/gal (0.93-.97 kg/l)
VOC	<250 g/l

SURFACE PREPARATION

Surfaces should be free of standing water, surface dirt, dust, oils, cured materials, and other contaminants prior to application. MCI POWR should be applied to clean, dry surfaces. Surface, air, and material temperatures should be between 40-120°F (4-49°C) during application.

If a coating will be used over MCI POWR, a 7 day waiting period is recommended and compatibility testing should be performed.

PACKAGING AND STORAGE

When stored in original, airtight containers at or below 77°F (25°C), MCI POWR has a shelf life of 12 months from the date of shipment. MCI POWR is available in 5 gallon (19 liter) pails and 55 gallon (208 liter) drums.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

PERFORMANCE DATA

MCI POWR meets requirements for Alberta DOT Type 1B penetrating sealer. (Requirements for initial water repellency and repellency after abrasion are 70% and 86% respectively.)

Effect of Oil on Concrete Treated with MCI POWR			
	MCI POWR	Standard Sealer	Control
10W-30 Oil	No Staining	Oil Staining	Oil Staining
Water	No Effect	No Effect	No Effect

APPLICATION

A wet on wet application, using a coverage rate of 125 - 175 ft^2/gal (3.0 - 4.3 m^2/l) is recommended for horizontal surfaces. Allow to fully dry before opening to traffic. For application to vertical surfaces, apply MCI POWR to saturation starting from the bottom of substrate and working up.

CONSIDERATIONS

MCI POWR should not be used on structures under hydrostatic pressure. DO NOT apply when temperature is at or below 0°C (32°F), or expected to fall below this temperature within 8 hours after application. DO NOT thin. It is recommended to keep away from moisture and to avoid rain for 4 hours after application. Stir thoroughly before use. MCI POWR performance is closely tied to the preparation of the substrate to be treated. See specification for full application instructions.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 9/19/12. ©Cortec Corporation 2012. Supersedes: 2/29/11

MCI® Wall Defense

PRODUCT DESCRIPTION

MCI Wall Defense is a clear, silicone elastomer-based anti-graffiti coating that can be applied to exterior concrete, masonry, and metal surfaces. It is designed to be used over various types of masonry that are both coated and uncoated.

MCI Wall Defense is a permanent coating that does not need to be recoated after graffiti removal like alternative sacrificial systems.

After 24 hours of first applying the coating, it can be tagged without affecting the graffiti resistance. MCI Wall Defense can be recoated with itself at any time. Overspray should not effect surrounding plant life or electrical boxes.

FEATURES

- Excellent graffiti resistance
- Breathable
- Excellent exterior durability
- VOC Compliant
- High UV Resistance
- Excellent gloss retention
- Elastomeric properties
- Hydrophobicity

APPLICATION

MCI Wall Defense may be applied by spray, brush, or roller at temperatures over 40°F (5°C) and wind less than 5 mph. A film thickness of 12-15 dry mils (300-375 microns) is recommended on new or uncoated cement. The coating dries to touch in 2 hours. Any tagging is removed with a cold water pressure cleaning of ~ 1200 psi (80 bar); no special cleaning agents are needed. Landscaping surrounding project should be finished prior to application to minimize contamination of the coating.

TYPICAL USES

- DOT
- Schools and Universities
- Port authorities
- Transit authorities
- Transportation - railcars
- Parking decks
- Urban commercial properties

SUBSTRATES PROTECTED

Concrete
Masonry
Metal
Wood

TYPICAL PROPERTIES

Appearance	Cloudy viscous liquid
NVC	75-80% by weight
Shelf life	1 year
Density	7.8-8.3 lb/gal (0.93-0.99 kg/l)
Coverage Rate	80-100 ft^2/gal (2.0-2.5 m^2/l)
VOC	2.0-2.1 #/gal (239.6-251.6 g/l)
Expected Coating Life	4-6 years when power washed once a week 5-10 years when power washed once a month

PROPERTIES

DFT	12-15 mils (300-375 microns)
WFT	15-25 mils (375-625 microns)
QUV Gloss Retention	1000+ hours, 80%
ASTM D 1653 (Water vapor transmission)	18 perms
Gloss	30°-50°

DRY TIME

Dry to touch	2 hours at 77°F (25°C)
Tack free	4 hours at 77°F (25°C)
Tag time	after 24 hours at 77°F (25°C)
Full cure	7 days at 77°F (25°C)

ASTM D 7089 Graffiti Removal Testing		
GRAFFITI	RATING	% REMOVAL
Black solvent based spray paint	Cleanability 1	100%
Blue solvent based spray paint	Cleanability 1	100%
Red solvent based spray paint	Cleanability 1	100%
Black solvent based marker	Cleanability 1	75%

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

Blue solvent based marker	Cleanability 1	50%
Red solvent based marker	Cleanability 1	75%
Black water based marker	Cleanability 1	100%
Blue water based marker	Cleanability 1	100%
Red water based marker	Cleanability 1	100%
Black solvent based marker	Cleanability 2	100%
Blue solvent based marker	Cleanability 2	80%
Red solvent based marker	Cleanability 2	100%

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Masonry

For surfaces prepared by water jetting/blasting, the SSPC-Vis 4(1)/NACE No. 7 standards for surface cleanliness should be followed.
The visual surface cleanliness must conform, at minimum, to the Vis WJ-4 condition directly after water jetting/blasting.

Previously Painted

If previously painted surface is in sound condition, clean surface of all foreign material. Smooth, hard, or glossy coatings should be dulled by abrading the surface.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip size may be needed for proper spray characteristics. Always purge spray equipment before use.

Airless spray

Pressure	3200-3600 psi (220-248 bar)
Hose	3/8″
Tip	.013″-.017″
Filter	60 mesh

Brush

Brush	Natural Bristle
Reduction	None required

Roller

Cover	3/8″-1/2″ woven with solvent resistant core
Reduction	None required

PACKAGING AND STORAGE

MCI Wall Defense is packaged in 5 gallon pails, 55 gallon drums, or 275 gallon totes.

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 2/3/12. Cortec Corporation 2010-2012. All rights reserved. Supersedes: 4/18/11.

MCI®-2018 Sealer
MCI®-2018 FD Sealer
MCI®-2018 V/O Sealer
MCI®-2018 V/O FD Sealer

PRODUCT DESCRIPTION

MCI-2018 is a 100% silane concrete sealer containing time-proven Migrating Corrosion Inhibitors (MCI®). MCI-2018 penetrates deep into concrete providing corrosion protection to reinforcing steel from existing water and chloride ions, or other contaminants. MCI-2018 also provides water repellency by chemically reacting with the cementitious substrate under proper application, decreasing the ingress of additional aggressive materials.

MCI-2018 V/O is particularly formulated for application on vertical surfaces. MCI-2018 FD and MCI-2018 V/O FD both contain a red fugitive dye to aid in uniform application and job inspection. The color will stay on concrete for about 7 days but fade in about 30 days, depending on sunlight (UV)exposure.

ADVANTAGES

- Migrates into even the densest concrete
- Forms a monomolecular corrosion inhibiting layer on the 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
- Non-toxic, contains no nitrites, phosphates, or chromates
- No blushing, peeling, or yellowing
- Complies with Alberta DOT Standards for Type 1b and Type 1c sealers

TYPES OF APPLICATIONS

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

TECHNICAL DATA FROM LABORATORY TESTS

Alberta Transportation Specification B388

MCI-2018 meets Alberta DOT Type 1b and Type 1c sealer requirements for vapor transmission and water-proofing performance.

NCHRP - Series II

Reduction in Chloride Ion Content

Single coat application, at 125 ft^2/gal (10 m^2/l), showed an 88% reduction in chloride ion content.

NCHRP - Series IV, Southern Exposure

Accelerated Weathering Tests

Single coat application at 125 ft^2/gal (10 m^2/l), had zero discoloration and reduced chloride ion intrusion by 98% compared to a control.

ASTM C-642

Water Absorption of Concrete

Single coat application, at 125 ft^2/gal (10 m^2/l), showed a 74% reduction after 50 days compared to the control.

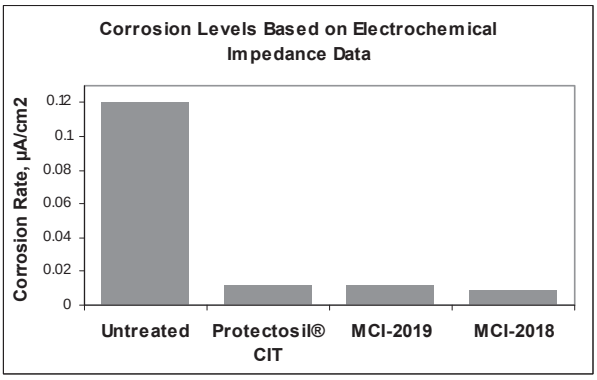
MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

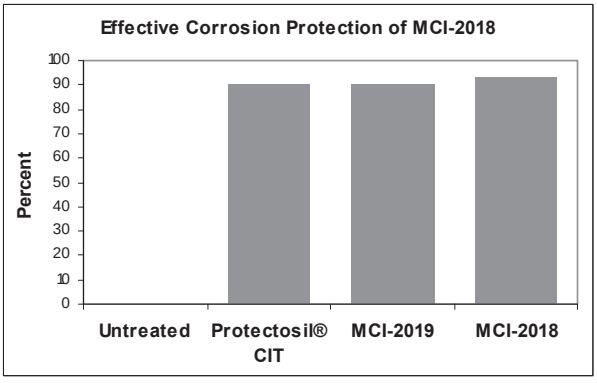
ASTM C-672
Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals
Results show little or no change after more than 50 cycles of freeze-thaw with the use of deicing salts on coated concrete samples.

AASHTO T-259
Resistance of Concrete to Chloride Ion Penetration
Treated samples showed an 82.6% reduction in chloride ion penetration compared to the control. Depths from 0.5-1.0 inches contained negligible amounts of chloride ions.

ASTM E-514
Water Penetration and Leakage Through Masonry
Treated samples had a 95% reduction in leakage rate compared to the control.

Federal Specification SS-W-110C
Water Repellency
Single coat application at 125 ft^2/gal (10 m^2/l), resulted in a 0.39% water absorption; exceeding the 1.0% specification maximum.





*According to Cortec Corporation Laboratory test report 08-121-1425
**Protecsil is a registered trademark of Evonik Industries

As the graph indicates, MCI-2018 provides >92% protection from corrosion when compared to untreated concrete and outperforms the competitive products.

COVERAGE RATE
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.

TYPICAL PROPERTIES
Appearance:

MCI-2018	Clear colorless to yellow liquid
MCI-2018 FD	Reddish hazy liquid
MCI-2018 V/O	Hazy colorless to yellow liquid
MCI-2018 V/O FD	Reddish hazy liquid
pH	9.5-10.5 (1% in water)
Density	7.3-7.7 lb/gal (0.87-0.92 kg/l)
VOC	2.2 lb/gal (245 g/l)
Coverage Rate	125-175 ft^2/gal (3-4.3 m^2/l)

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

APPLICATION

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

Application can be performed using 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 is used, application should continue until the substrate is thoroughly saturated. Sprayers should be fitted with solvent resistant hoses and gaskets.

For best results, two applications are recommended, with the second application being applied using a wet on wet technique, i.e.: the surface is wet from the first application, but not glossy. During application, precautions should be taken to protect the surrounding area from overspray and run-off.

PACKAGING AND STORAGE

MCI-2018 should be kept away from moisture. When stored in original, airtight containers in a cool, well ventilated place, MCI-2018 has a shelf life of 12 months from the date of shipment. Stir thoroughly before use.

MCI-2018 is available in 5 gallon (19 liter) pails and 55 gallon (208 liter) drums.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

CORTEC CORPORATION

Environmentally Safe VpCI®/MCI® Technologies

Distributed by:

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

printed on recycled paper 100% post consumer

MCI®-2019
MCI®-2019 FD

PRODUCT DESCRIPTION

MCI-2019 is a 40% silane, solvent-based concrete sealer 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 red fugitive dye, which fades with time, to confirm application.

HOW IT WORKS

MCI-2019 combines a silane water repellant with Migratory Corrosion Inhibitor 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.

- 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 and increases surface abrasion resistance
- 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

TYPICAL PROPERTIES

MCI-2019	
Appearance	Light yellow liquid
pH	8.7-9.5 (1% in aqueous)
MCI-2019 FD	
Appearance	Red liquid
pH	9.0-10.0 (1% in aqueous)
Density (both versions)	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 25°C (77°F).

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 proper application, dosing, etc.

PACKAGING

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

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

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^2/gal (10 m^2/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 deicer freezing and thawing using air entrained concrete specimens where as the control had moderate to severe scaling.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT SAFETY DATA SHEET FOR MORE INFORMATION

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.

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, two applications are recommended with the second application applied using a wet on wet technique; i.e. the surface is wet from the first application, but not glossy. 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. A compatibility test should also be performed.

CONSIDERATIONS

- MCI-2019/MCI-2019 FD should be kept away from heat and open flame.
- MCI-2019/MCI-2019 FDshould 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 repellants, 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

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer

MCI®-2019 W/MCI®-2019 W FD

PRODUCT DESCRIPTION

MCI-2019 W is a one component, VOC compliant, clear, penetrating, breathable 40% water-based silane sealer, containing Cortec's migrating corrosion inhibitor technology. The sealer is composed of a stable 40% alkylalkoxy silane emulsion in water. MCI-2019 W is specifically developed to protect new and existing concrete structures against the damaging effects of moisture intrusion, freeze/thaw scaling, and chloride-ion (salt) intrusion.

MCI-2019 W will penetrate the concrete and provide water repellency by chemically reacting with the cementitious substrate under proper application. Treated substrates are hydrophobic and retain their original appearance. MCI-2019 W is also availabe with a fugitive dye to aid in applications as MCI-2019 W FD.

MCI-2019 W's unique feature is its Migratory Corrosion Inhibitor action that allows this product to migrate through even the densest concrete structures. It seeks out embeded steel reinforcing bars to form a protective, monomolecular corrosion inhibiting coating.

APPLICATION

Application to horizontal surfaces should be done in a flooding action using a low-pressure sprayer. Normal coverage rates are 125 - 175 ft^2/gal (3.0 - 4.3 m^2/l). Allow to fully dry before opening to traffic. For application to vertical surfaces, apply MCI-2019 W to saturation with a low-pressure sprayer. Start at the bottom of the wall and work up.

Surfaces should be free of standing water, surface dirt, dust, oils, cured materials, and other contaminants prior to application. MCI-2019 W should be applied to clean, dry surfaces. Surface, air, and material temperatures should be between 40-120ºF (4-49ºC) during application.

If a coating will be used over MCI-2019 W, a 7 day period is recommended before coating, and a compatibility test should also be performed.

TYPICAL USES

- Commercial Buildings
- Parking Decks/Garages
- Highways
- Bridge structures

ADVANTAGES

- MCI-2019 W offers engineers, owners, contractors, DOTs, and government agencies a time proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures
- Protects against the harmful effects of corrosion by migrating into even the densest concrete
- Migratory inhibitor reduces further corrosion of the most rusted metals
- Easily applied by spray, roller, squeegee, or paint brush to any concrete surface, reducing the high cost of labor and equipment
- Non-toxic, contains no nitrites, phosphates, or chromates
- MCI-2019 W silane sealer molecules are very small, allowing penetration into the smallest concrete pores
- Enhances the durability of reinforced concrete and increases surface abrasion resistance
- Blocks carbonation and chloride ion intrusion
- Allows concrete to breathe and vapor to diffuse; is not a vapor barrier
- Helps protect against acid and chemical attack
- No blushing, peeling, or yellowing
- Resistant to alkali attack

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

PHYSICAL PROPERTIES

MCI-2019 W

Appearance	Milky White Liquid
pH	10.3-11.3 (neat)
Density	7.9-8.1 lb/gal (0.95-0.97 kg/l)
VOC	<250 g/l

MCI-2019 W FD

Appearance	Blue Green Liquid
pH	10.3-11.1 (neat)
Density	7.6-8.1 lb/gal (0.91-0.97 kg/l)
VOC	<250 g/l

APPLICATION CONSIDERATIONS

MCI-2019 W should not be used on structures under hydrostatic pressure. DO NOT apply when temperature is at or below 0ºC (32ºF), or expected to fall below this temperature within 8 hours after application. DO NOT thin. It is recommended to keep away form moisture and to avoid rain for 4 hours after application. Stir thoroughly before use. MCI-2019 W performance is closely tied to the preparation of the substrate to be treated. See specification for full application instructions.

PACKAGING AND STORAGE

When stored in original, airtight containers at or below 77ºF (25ºC), MCI-2019 W has a shelf life of 12 months from the date of shipment.

MCI-2019 W is available in 5 gallon (19 liter) pails and 55 gallon (208 liter) drums.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 7/24/12. Cortec Corporation 2004-2012. All rights reserved. Supersedes: 8/3/10

MCI®-2020/MCI®-2020 V/O

DESCRIPTION

MCI-2020 is a surface applied, migrating corrosion inhibitor designed to penetrate through cementitious materials including concrete, mortar, and limestone. MCI-2020 migrates in both liquid and vapor (gas) phases through the pore structure, forming a protective, molecular layer on embedded reinforcement. MCI-2020 provides corrosion protection against carbonation, chlorides, and other contaminants. MCI-2020 V/O is a high viscosity version of MCI-2020 which is specifically designed for vertical and overhead applications.

HOW IT WORKS

MCI-2020/MCI-2020 V/O are organic corrosion inhibitors. They are considered ambiodic (mixed) inhibitors which means they protect both anodic and cathodic areas within a corrosion cell. MCI-2020/MCI-2020 V/O contain a synergistic blend of amino-alcohols and salts of carboxylic acids which form a protective layer on embedded reinforcement delaying the onset of corrosion as well as reducing existing corrosion rates.

WHERE TO USE

MCI-2020 and MCI-2020 V/O are recommended for:

- Preventative maintenance of existing reinforced, precast, prestressed, post-tensioned, or marine concrete structures
- Bridges, highways, and industrial floors exposed to aggressive environments (chemicals, deicing salts, carbonation, atmospheric attack)
- Parking garages
- Concrete piers, dams, offshore platforms, piles, pillars, pipes, utility poles, and cooling towers
- Concrete potable water structures
- As a component of Cortec's High Performance Repair System™ (HPRS®)

ADVANTAGES

MCI-2020/MCI-2020 V/O offer engineers, owners, contractors, DOTs, and other government agencies a time proven, corrosion inhibiting technology that will extend the service life of their reinforced concrete structures.

- Protects against corrosion caused by carbonation, chlorides, and other aggressive contaminants
- Effectively reduces corrosion rates on metals with existing corrosion
- ANSI/NSF Standard 61 Approval for structures containing potable water
- Water based and non-flammable
- Does not etch, stain, discolor, or otherwise harm glass, metals, or automotive paint
- Does not contain calcium nitrite
- Does not contain wax
- Does not require removal of sound concrete
- Allows vapor diffusion (not a vapor barrier)
- Easily applied by spray, brush, or roller
- Minimal curing time, traffic may resume minutes after application if necessary (dry to touch)
- Migrates independent of orientation (horizontal, vertical, overhead)
- Migrates up to 3 inches in 30 days
- Proven performance in both lab and field testing
- MCI-2020 V/O available for vertical and overhead surfaces

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

PHYSICAL PROPERTIES

MCI-2020

Appearance	Clear to slightly hazy, amber liquid
pH	9.0-9.5 (neat)
Density	8.6-8.8 lb/gal (1.03-1.05 kg/l)
Water Vapor Transmission	1.72 perms (TCG Project # 09146)
Shelf Life	24 months in sealed container
Storage	32°F (0°C)-150°F (60°C) Do NOT Freeze

MCI-2020 V/O

Appearance	Clear, yellow, viscous liquid
pH	9.0-9.7 (neat)
Density	8.6-8.8 lb/gal (1.03-1.05 kg/l)
Shelf Life	24 months in sealed container
Storage	32°F (0°C)-150°F (60°C) Do NOT Freeze

COVERAGE

MCI-2020 is applied in a single coat at 150 ft²/gallon (3.68 m²/liter) to horizontal surfaces. It is applied in two coats at 300 ft²/gallon (7.36 m²/liter) to vertical and overhead surfaces. MCI-2020 V/O is applied in a single coat at 150 ft²/gallon (3.68 m²/liter) on most surfaces. In the case of extremely dense overhead surfaces, it can also be applied in two coats at 300 ft²/gallon (7.36 m²/liter).

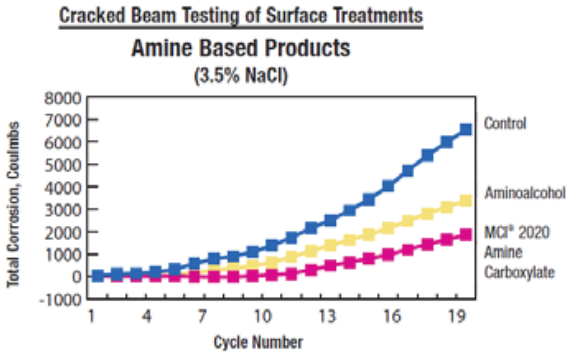
PACKAGING

MCI-2020 and MCI-2020 V/O are available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, and 275 gallon (1040 liter) totes.

MCI-2020 and MCI-2020 V/O are also available with a blue fugitive dye (MCI-2020 BFD and MCI-2020 V/O BFD) which helps to easily identify treated areas.

PERFORMANCE DATA

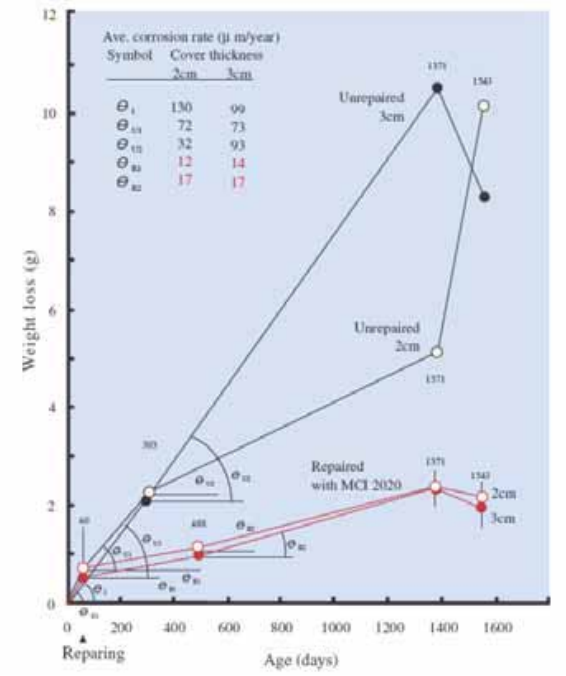
Corrosion Rate Reduction – Crack Performance (adapted from ASTM G109)



MCI-2020 reduced corrosion current by 72% compared to the untreated sample, and also outperformed the aminoalcohol based surface treatment.

Sherman, Matthew R., Krauss, Paul D. Cracked-Beam Corrosion Tests of Concrete Treated with MCI-2000 and MCI-2020 Corrosion Inhibitors, Final Report, WJE No. 922041. January 1995.

Corrosion Rate Reduction – Pre-existing Chlorides



MCI-2020 treated specimens decreased the amount of corrosion up by ½ to 1/6 that of the control samples. When applying MCI-2020 after cracks appeared, it worked very well in reducing corrosion rates in samples. Study used ASTM G109 sized beams cast with 3 rebar in a triangular array. Chloride solution was ponded on the surface for 2 weeks of a 4 week test cycle. Half-cell potentials and corrosion current readings were taken monthly.

Nagayama, Dr. Masaru; Shimozawa, Mr. Kazuyuki. Long Term Corrosion Testing of MCI-2020 (November 1994-April 1999). General Building Research Corporation of Japan. April 1999.

Penetration Into Concrete, Film Forming Capability, Chloride Displacement

Mass Concentration %

Sample	Etch Time (seconds)	Fe 2p	O 1s	C 1s	N 1s	Cl 2p	Ca 2p	Si 2p
Untreated	0	6.27	42.71	30.67	0.19	1.07	14.19	4.97
Untreated	120	13.60	39.43	23.08	0.14	1.06	17.59	5.19
Untreated	240	14.65	38.77	22.35	0.11	1.01	18.18	5.03
L2020	0	2.30	42.22	29.90	1.16	0.95	17.28	6.26
L2020	120	2.53	43.01	25.17	1.12	0.93	20.14	7.18
L2020	240	2.56	43.85	21.95	1.05	1.40	22.19	7.09
L2020M	0	2.02	40.20	38.55	1.32	0.87	11.54	5.53
L2020M	120	2.22	41.74	32.13	1.29	0.86	15.41	6.42
L2020M	240	2.82	43.61	28.99	1.15	0.83	15.92	6.68

Table 1 - XPS analysis on concrete samples after 500 days, showing the changes in chemistry with etch time.

XPS analysis demonstrated the presence of inhibitor on steel rebar surfaces at levels 85 nm below the unetched surfaces (MCI-2020 M) and 75 nm (MCI-2020). The XPS results showed similar diffusion rates for the MCI and the corrosive species. The MCI-2020/MCI -2020 M inhibitors were able to provide a protective film on the rebar surface, whereas the untreated samples were subjected to localized corrosion attack. From the XPS depth profiling, chloride was detected at depths of 60 nm from the analysis surface on the bar and at a concentration of roughly 0.44 weight percent for the untreated samples and 0.14% for treated samples, confirming displacement of the chloride ions. (NOTE: 10 nm = 100 Å)

Bavarian, Behzad, PhD. and Reiner, Lisa. The Efficacy of using Migrating Corrosion Inhibitors (MCI 2020 & MCI 2020M) for Reinforced Concrete. California State University, Northridge, College of Engineering and Computer Science. March 2004.

SURFACE PREPARATION

Surfaces should be dry, clean, and free of all oil, grease, efflorescence, water repellants, coatings, membranes, and asphalt. Cleaning may be done by steam cleaning, waterblasting, or sandblasting.

APPLICATION

Apply MCI-2020/MCI-2020 V/O by spray (conventional airless or hand pressure spray equipment), brush, or roller according to coverage rates listed above. If applying more than one coat, allow the surface to dry enough between applications so that the second coat penetrates into the surface within 15 minutes. When applying a water repellant, coating, repair mortar, or overlay over MCI-2020/MCI-2020 V/O, the surface should be rinsed with water, pressure washed, or blast-cleaned to remove any residue unless prior adhesion testing has been performed. Consult product specifications for more detailed application instructions.

CONSIDERATIONS

- Substrate and ambient temperature should be above 35°F (2°C) and below 125°F (50°C)
- Do not apply if temperature is expected to fall below 32°F (0°C) within 12 hours after application
- MCI-2020/MCI-2020 V/O will not penetrate water repellants, coatings, paints, membranes, or asphalt
- If structure will be submerged after application of MCI-2020/MCI-2020 V/O, it is recommended to use a waterproofing coating over MCI-2020/MCI-2020 V/O prior to submersion
- Maximum chloride content at the depth of reinforcement in structures being treated with MCI-2020/MCI-2020 V/O is 6 lb/yd^3 (3.5 kg/m^3). For higher levels, consult Cortec technical service
- Do not apply if precipitation is expected within 8 hours after application

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer

MCI®-2020 M
MCI®-2020 M V/O

PRODUCT DESCRIPTION

MCI-2020 M is a surface-applied corrosion inhibitor designed to migrate through concrete structures and seek out steel reinforcing bars embedded in concrete. This product protects carbon steel, stainless steel, galvanized steel, and aluminum.

MCI-2020 M provides effective protection to metals due to enhanced film-forming properties, reducing further corrosion on reinforcing metals and extending the service life of the structure.

A high viscosity version of MCI-2020 M is available: MCI-2020 M V/O specifically designed for vertical and overhead application.

Note: A UV tracer may be added upon request.

WHERE TO USE

MCI-2020 M is recommended for:

- All reinforced, precast, prestressed, post-tensioned, or marine concrete structures
- Steel reinforced concrete bridges, highways, and streets exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- Parking decks, ramps, and garages
- Preventive maintenance of all reinforced concrete commercial and civil engineered structures
- Concrete piers, dams, offshore platforms, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures
- Buildings and foundations of all types

ADVANTAGES

- Offers engineers, owners, contractors, DOTs, and government agencies a time-proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures in high concentration of chloride
- Protects against the harmful effects of corrosion by migrating into even the densest concrete
- The migratory inhibitor reduces active corrosion of metals in high chloride environments
- Easily applied by spray, roller, squeegee, or paint brush to any concrete surface, reducing the high cost of labor and equipment
- Does not contain any calcium nitrite
- Water-based and non-flammable for easy handling
- Does not require the removal of sound concrete
- Organic, safe, and environmentally friendly
- Allows concrete to “breathe” and vapor to diffuse, is not a vapor barrier
- Protects both anodic and cathodic areas
- Proven to migrate to adjacent areas to protect surrounding metals
- No cure time is required - traffic may resume minutes after application if necessary
- MCI-2020 M is NSF Standard 61 approved for potable water applications (certified by Underwriters Laboratories)

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

MIXING INSTRUCTIONS

MCI-2020 M and MCI-2020 M V/O come ready to use and should not be diluted.

COVERAGE

Coverage is 150 ft^2/gal (3.68 m^2/L). Dense substrates and vertical/overhead areas may require two coats at the rate of 300 ft^2/gal (7.36 m^2/L).

SURFACE PREPARATION

Surface should be dry, sound, clean and free of all dirt, oil, grease efflorescence, sealers, coatings, membranes, and asphalt. Cleaning may be done by steam cleaning, water-blasting, or sandblasting.

APPLICATION

Apply MCI-2020 M by spray (conventional airless or hand pressure spray equipment), roller, squeegee, or paint brush to any concrete surface. Dense substrates may require two (2) coats with a minimum of 7½ hours between coats. In most cases, MCI Architectural Coating can be applied without rinsing. However, if the MCI-2020 M was overdosed, rinse it (after 24 hours) with water, pressure wash or blast clean before applying the MCI Architectural Coating. A water rinse and adhesion test is required before application of any other coatings.

APPLICATION CONSIDERATIONS

The substrate and ambient temperature should be above freezing. Do not apply if temperature is expected to fall below freezing within 12 hours. MCI will not penetrate film-forming sealers, coatings, paints, membranes, or asphalt.

PHYSICAL PROPERTIES

MCI-2020 M

Appearance	Clear to hazy yellow to amber liquid
pH	10.6-11 (neat)
Non-volatile content	14-15 %
Density	8.4-8.8 lb/gal (1.01-1.05 kg/L)

MCI-2020 M V/O

Appearance	Clear yellow viscous liquid
pH	9-10.9 (neat)
Non-volatile content	13-18
Density	8.8-8.9 lb/gal (1.05-1.07 kg/L)

PACKAGING AND STORAGE

MCI-2020 M and MCI-2020 M V/O are available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes, and bulk. Keep from freezing. Shelf life is 24 months in a sealed drum.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

MCI®-2020 M SC (concentrated version)

PRODUCT DESCRIPTION

MCI-2020 M SC is a super concentrated surface-applied corrosion inhibitor designed to migrate through concrete structures and seek out steel reinforcing bars embedded in concrete. This product protects carbon steel, stainless steel, galvanized steel, and aluminum.

MCI-2020 M SC provides effective protection to metal due to enhanced film-forming properties, reducing further corrosion on metals and extending the service life of the structure.

Note: A UV tracer may be added upon request. (MCI-2020 M SC UV)

MCI-2020 M SC is also available with a blue fugitive dye (MCI-2020 M SC BFD) which helps to easily identify treated areas.

WHERE TO USE

MCI-2020 M SC is recommended for:

- All reinforced, precast, prestressed, post-tensioned, or marine concrete structures
- Steel reinforced concrete bridges, highways, and streets exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- Parking decks, ramps, and garages
- Preventive maintenance of all reinforced concrete commercial and civil engineered structures
- Concrete piers, dams, offshore platforms, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures
- Buildings and foundations of all types

ADVANTAGES

- Offers engineers, owners, contractors, DOTs, and government agencies a time-proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures in high concentration of chloride
- Protects against the harmful effects of corrosion by migrating into even the densest concrete
- The migratory inhibitor reduces active corrosion of metals in high chloride environments
- Easily applied by spray, roller, squeegee, or paint brush to any concrete surface reducing the high cost of labor and equipment
- Does not contain any calcium nitrite
- Water-based and non-flammable for easy handling
- Does not require the removal of sound concrete
- Organic, safe, and environmentally friendly
- Allows concrete to "breathe" and vapor to diffuse; is not a vapor barrier
- Protects both anodic and cathodic areas
- Proven to migrate to adjacent areas to protect surrounding metals
- No cure time is required - traffic may resume minutes after application if necessary
- NSF Standard 61 approved for potable water applications (certified by Underwriters Laboratories) once diluted with water at a 1:1ratio.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

MIXING INSTRUCTIONS

Mix one part MCI-2020 M SC concentrate to one part tap water at ambient temperature. Mix at low to medium speed until fully blended.

COVERAGE

Coverage after mixing instructions have been followed is 150 ft^2/gal (3.68 m^2/L). Dense substrates and vertical/ overhead areas may require two coats at the rate of 300 ft^2/gal (7.36 m^2/L).

SURFACE PREPARATION

Surface should be dry, sound, clean and free of all dirt, oil, grease efflorescence, sealers, coatings, membranes, and asphalt. Cleaning may be done by steam cleaning, water-blasting, or sandblasting.

APPLICATION

Apply MCI-2020 M SC by spray (conventional airless or hand pressure spray equipment), roller, squeegee, or paint brush to any concrete surface. Dense substrates may require two (2) coats with a minimum of 7½ hours between coats. In most cases, MCI Architectural Coating can be applied without rinsing. However, if the MCI-2020 M SC was overdosed, rinse with water, pressure wash, or blast clean before applying the MCI Architectural Coating. A water rinse and adhesion test is required before application of any other coatings.

APPLICATION CONSIDERATIONS

The substrate and ambient temperature should be above freezing. Do not apply if temperature is expected to fall below freezing within 12 hours. MCI will not penetrate film-forming sealers, coatings, paints, membranes, or asphalt.

PHYSICAL PROPERTIES

MCI-2020 M SC (concentrate)

Appearance	Clear to hazy yellow to amber liquid
pH	9-10.5 (1% aqueous)
Non-volatile content	28-33%
Density	8.8-9.0 lb/gal (1.05-1.08 kg/L)

PACKAGING AND STORAGE

MCI-2020 M SC is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes, and bulk. Keep from freezing. Shelf life is 24 months in a sealed drum.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer

MCI®-2020 Powder & MCI®-2020 V/O Powder

PRODUCT DESCRIPTION

MCI-2020 Powder is a water-soluble migratory corrosion inhibitor for the treatment of existing concrete structures. It is designed to migrate through even the densest of structures and seek out embedded steel reinforcing bars. MCI-2020 Powder also protects a multitude of other metals including carbon steel, galvanized steel and aluminum. The unique feature of Migrating Corrosion Inhibitors (MCI) is that even if not in direct contact with metals, the inhibitor will migrate a considerable distance through concrete to provide protection. MCI-2020 Powder will reduce corrosion of reinforcing metals and extend the service life of the structure. A special version of MCI-2020 Powder - MCI-2020 V/O Powder is designed for vertical and overhead applications.

WHERE TO USE

MCI-2020 Powder is recommended for:

- All reinforced, precast, prestressed, post-tensioned, or marine concrete structures
- Steel-reinforced concrete bridges, highways, and viaducts exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- Parking decks, ramps, and garages
- Preventive maintenance of all reinforced commercial and civil engineered concrete structures
- Concrete piers, dams, offshore platforms, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures
- Plant floors subject to chemical and/or acid attack
- Buildings and foundations of all types
- Cooling towers and potable water tanks

ADVANTAGES

- MCI-2020 Powder offers engineers, owners, contractors, DOTs, and government agencies a time proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures
- Protects against the harmful effects of corrosion by migrating into even in the densest concrete
- Migratory inhibitors reduce further corrosion of rusted metals
- Once diluted, easily applied by spray, roller, squeegee, or paint brush to any concrete surface reducing the high cost of labor and equipment
- Does not contain any calcium nitrite
- Water-soluble and non-flammable for easy handling
- Does not require the removal of sound concrete
- Organic, safe, and environmentally friendly
- Enhances the durability of reinforced concrete
- Lab and field tested worldwide
- Allows concrete to breathe and vapor to diffuse, is not a vapor barrier
- Protects both anodic and cathodic areas of reinforcing steel (or metal)
- Proven effective in the Strategic Highway Research Program (SHRP) funded by the federal government and state DOTs
- Confirmed effective in international documented field evaluation (ASTM G-109, Industrial Standards (IS) Japan and Korea, etc.)
- Proven to migrate and protect reinforced concrete in adjacent areas

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

- No cure time is required - traffic may resume minutes after application if necessary
- Non-hazardous, 100% concentrated product, thus economical and convenient for all types of transportation
- UV tracers can be added to confirm application

PACKAGING

MCI-2020 Powder and MCI-2020 V/O Powder are available in 100 pound (45 kg) bags. One 100 lb drum (45 kg) will yield 55 gallons (208 liters) of ready-to-use MCI-2020 liquid.

MCI-2020 Powder and MCI-2020 V/O Powder are also available with a blue fugitive dye (MCI-2020 Powder BFD, MCI-2020 V/O Powder BFD), which helps to easily identify treated areas.

SURFACE PREPARATION

Surface should be dry, sound, clean and free of all dirt, oil, grease efflorescence, sealers, coatings, membranes, and asphalt. Cleaning may be done by steam cleaning, water-blasting or sandblasting.

MIXING

Dissolve MCI-2020 Powder in fresh tap water. Use 1 part MCI-2020 Powder to 4 parts water by weight. MCI-2020 V/O Powder requires a mixing time of 30-40 minutes to establish the correct viscosity.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

APPLICATION

Apply the solution by spray (conventional airless or hand pressure spray equipment), roller, squeegee, or paint brush to any concrete surface at a rate of 150 ft^2/gal (3.68 m^2/L). Dense substrates may require two coats at the rate of 300 ft^2/gal (5.52 m^2/L) with a minimum of 8 hours between coats. The surface should be rinsed with water, pressure washed, or blast-cleaned to remove any residue prior to applying a sealer, coating, repair mortar, or concrete overlay.

LIMITATIONS

Once mixed into solution, MCI-2020 Powder and MCI-2020 V/O Powder should be kept above freezing and below 125°F (50°C). Do not apply if the temperature is expected to fall below freezing within 12 hours. MCI will not penetrate film-forming sealers, coatings, paints, membranes, or asphalt. As a dry powder or as a properly diluted liquid solution, MCI-2020 Powder and MCI-2020 V/O Powder have shelf lives of 2 years in sealed drums.

PHYSICAL PROPERTIES

(for MCI-2020 Powder & MCI-2020 V/O Powder with and without UV tracer)

Appearance	White to Off White powder
pH	5.9-7 (1% aqueous)
Storage/Shelf Life	24 months in sealed drums
Alkalinity Test	600 mg/L

MIXED PROPERTIES

MCI-2020 & MCI-2020 V/O (with and without UV tracer)

pH	9-9.7
Density	8.6-8.8 lb/g (1.03-1.05 kg/l)
Non-Volatile	20-27%

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 1/24/11. Cortec Corporation 2002-2011. All rights reserved. Supersedes: 5/23/07.

MCI®-2021 Patented

PRODUCT DESCRIPTION

MCI-2021 is a concrete sealer that combines a blend of reactive silicates, surface-active agents, and Cortec's time-proven Migratory Corrosion Inhibitors (MCI®). MCI-2021 preserves and protects concrete by working with the chemistry of concrete. The reactive silicates penetrate up to $1^1/_2$ inches (3.75 cm) in concrete and react with calcium. The reaction products build additional insoluble silicate structures within the concrete. The newly built structure seals surface pores and creates a water repellent surface preventing carbonation and further intrusion of chloride. The concrete's ability to breathe is not affected.

MCI-2021's unique MCIs migrate through concrete structures to form a protective layer on embedded steel reinforcement. MCI-2021 also protects a multitude of other metals including carbon steel, galvanized steel, and aluminum. MCI-2021 will inhibit the further corrosion of reinforcing metals and extend the service life of the structure.

Note: A UV tracer may be added upon request.

WHERE TO USE

MCI-2021 is recommended for repair and maintenance of:

- All reinforced, precast, prestressed, post-tensioned, concrete structures; including bridges, piers, highways, parking decks, ramps, garages, buildings, and streets exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- Plant floors subject to chemical attack

ADVANTAGES

MCI-2021 offers engineers, owners, contractors, DOTs, and government agencies a time proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures.

- Protects against the harmful effects of corrosion by migrating into even the densest concrete
- Migratory inhibitor protects against corrosion and reduces existing corrosion rates
- Non-toxic and contains no nitrites, phosphates, or solvents
- Water-based and non-flammable for easy handling
- Enhances the durability of reinforced concrete and increases surface abrasion resistance
- Reduces carbonation and chloride ion intrusion
- Helps protect against chemical attack
- Not a vapor barrier-allows vapor transmission
- Proven to migrate to adjacent areas to protect surrounding metals

PHYSICAL PROPERTIES

Appearance	Slightly hazy off-white liquid
pH	11-12 (Neat)
Density	9.0-9.1 lb/gal (1.08-1.09 kg/L)
Total Alkalinity	65000-68000 mg/L (Neat)

COVERAGE

Application rates will vary, depending upon surface porosity and number of applications. The total overall dosage rate, (i.e. all coats combined), should be within 150-250 ft^2/gal (3.7-6.1 m^2/L). Example: if two coats are utilized then the dosage rate per coat should be between 300-500 ft^2/gal (7.4-12.2 m^2/L). Do not overdose.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

SURFACE PREPARATION

Surface should be dry to touch, sound, clean, and free of all dirt, oil, grease, efflorescence, sealers, coatings, membranes, and asphalt. Cleaning may be done by steam cleaning, water-blasting, or sandblasting. (MCI-2061 can be used for removal of oil/grease)

New concrete should be allowed to cure for 28 days before application. In addition, any repair work should be performed at least three days before application.

APPLICATION

Apply MCI-2021 by spray (conventional airless or hand-pressure spray equipment) to any concrete surface. Apply MCI-2021 until surface starts to get saturated. A minimum of two coats is required. Apply the second coat and any additional coats immediately after the previous coat is dry to the touch (normal drying time is 10-30 minutes, depending on temperature). Apply only as much sealer as the surface will readily absorb. After the final coat wait 10-30 minutes and wet the entire treated area with a light water spray to assist in penetration and/or removal of any residual MCI-2021 and purged chlorides.

Do not allow to pond at any time.

If a coating will be used over MCI-2021, a 14 day period is recommended before application. A compatibility test should also be performed.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

APPLICATION CONSIDERATIONS

The substrate and ambient temperature should be above freezing and below 100°F (38°C). Do not apply if the temperature is expected to fall below freezing within 12 hours. MCI-2021 will not penetrate film-forming sealers, coatings, paints, membranes, or asphalt. Do not apply if rain is expected within 8 hours of application. Protect all windows, doorways, lights, etc. from overspray.

Overdosing MCI-2021 can cause the appearance of white silicate crystal formations on the surface of the substrate, which are only removed by shotblast, grinding, etc.

TECHNICAL DATA

Test Results (AASHTO T-259, "Resistance of Concrete to Chloride Ion Penetration")

Depth, inch	Reduction, %
0.06-0.50	>47
0.50-1.00	63
1.00-2.00	50

Scaling Resistance of Concrete Surfaces Exposed to Deicer Chemicals ASTM C672

Concrete sealed with MCI-2021 had very slight scaling after 50 freeze/thaw cycles compared to moderate to severe scaling of the control.

PACKAGING AND STORAGE

MCI-2021 is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes, and bulk.

The shelf life of the product is 24 months in a sealed container.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI® MCI® Technologies

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

printed on recycled paper 100% post consumer

MCI®-2022 Sealer, Patented
MCI®-2022 V/O
MCI®-2022 UV

PRODUCT DESCRIPTION

MCI-2022 is a water-based, water-repelling sealer for concrete, brick, masonry units, etc. It is a ready-to-use product and is made up of a low VOC blend of silane/siloxane emulsions and time-proven Migrating Corrosion Inhibitors (MCI®). MCI-2022 penetrates the concrete, seals its surface and prevents carbonation and intrusion of water and chlorides. Treated concrete surfaces are fully breathable and their natural moisture-vapor transmissions are not affected.

MCI-2022's unique feature is its Migratory Corrosion Inhibitor action that will migrate through even the densest concrete structures. It seeks out the steel reinforcing bars embedded within to form a protective monomolecular, corrosion inhibiting coating. MCI-2022 also protects a multitude of metals including carbon steel, galvanized steel, and aluminum. A high viscosity version of MCI-2022 is available: MCI-2022 V/O, specifically designed for vertical and overhead applications. A UV tracer may be added if desired. Please request product MCI-2022 UV.

WHERE TO USE

MCI-2022 is recommended for:

- All reinforced, precast, prestressed, post-tensioned, or marine concrete structures
- Steel-reinforced concrete bridges, highways, and streets exposed to corrosive environments
- Parking decks, ramps, and garages
- All reinforced marine concrete structures
- Concrete piers, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures

ADVANTAGES

- MCI-2022 protects against the harmful effects of corrosion by migrating into even the densest concrete
- Migratory inhibitor reduces further corrosion of the most rusted metals
- VOC compliant
- Easily applied by spray, roller, squeegee, or paint brush to any concrete surface reducing the high cost of labor and equipment
- Non-toxic, contains no nitrites, phosphates, or solvents
- Water-based and non-flammable for easy handling
- Penetrates deep into concrete for anode and cathode protection
- Enhances the durability of reinforced concrete and increases surface abrasion resistance
- Blocks carbonation and chloride ion intrusion
- Allows concrete to breathe and vapor to diffuse, is not a vapor barrier
- Helps protect against acid and chemical attack
- No blushing, peeling, or yellowing
- Resistant to alkali attack

COVERAGE

Application rates will vary, depending upon surface porosity and number of applications. Approximate coverage rate is 125-175 ft^2/gal (3-4 m^2/1).

PHYSICAL PROPERTIES

	MCI®-2022	MCI®-2022 V/O
Appearance	Milky white liquid	Milky white viscous liquid
pH	9.5-10.5 (neat)	9.5-10.5
Density	8.3-8.4 lb/gal (0.99-1.01 kg/l	8.1-8.3 lb/gal (0.97-0.99kg/l
Total Alkalinity	100 mg/L	100 mg/L

CORTEC CORPORATION
Environmentally Safe VpCI™/ MCI® Technologies

SURFACE PREPARATION

Surface should be dry to touch, sound, clean and free of all dirt, oil, grease, efflorescence, sealers, coatings, membranes, and asphalt. Cleaning may be done by steam cleaning, water-blasting, or sandblasting.

As a standard procedure, fresh concrete should be allowed to cure for 28 days before application. In addition, any repair work should be performed at least three days before application. Protect all windows, doorways, lights, etc.

APPLICATION

MCI-2022 should be stirred before application to ensure proper distribution of active ingredients. Do not alter or dilute the material. Do not apply to a wet or damp substrate. Application should be made by flooding, brushing, or spraying until the surface is saturated. On vertical surfaces, apply MCI-2022 in a flooding application, from the bottom up so the material runs down 6-8 inches (15-20 cm) below the spray pattern. On horizontal surfaces, the liquid material should pond on the surface at least 5 seconds before being absorbed.

If a coating will be used over MCI-2022, a 7 day period is recommended before coating. A compatibility test should also be performed.

LIMITATIONS

The substrate and ambient temperature should be above freezing and below 125^{O}F (50^{O}C). Do not apply if the temperature is expected to fall below freezing within 12 hours. MCI-2022 will not penetrate film-forming sealers, coatings, paints, membranes, or asphalt.

TECHNICAL DATA FROM LABORATORY TEST

Testing Method	Properties	Test Results
SS-W-110C	Water absorption Reduction (Absorption vs. Control)	92%
NCHRP 244 Series II	Chloride ion intrusion reduction (Intrusion vs. Control)	90%
EIS (Electrochemical Impedance Spectroscopy)	Corrosion Protection to Rebar	Corrosion rate of embedded rebars is 2-4 times lower than with the same type of conventional sealers

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

PACKAGING

MCI-2022 is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes, and bulk.

Shelf life: 12 months when stored in original, airtight containers and ambient temperature.

Distributed by:

CORTEC CORPORATION

Environmentally Safe VpCI™/MCI® Technologies

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

printed on recycled paper ♻ 100% post consumer
Revised 12/28/07.

Supersedes: 1/04/07.

MCI®-2023 Passivating Grout, Patent Pending

PRODUCT DESCRIPTION

MCI®-2023 is a two component system incorporating Migrating Corrosion Inhibitors (MCI®) that forms a cement slurry for the protection of reinforcing steel and metals. The resulting slurry has good adhesion to the substrate, high durability and abrasion resistance, stops corrosion and forms an effective barrier against penetration of water and water dissolved salts. MCI®-2023 powder formulation is based on hydraulic binders and complexing and osmotic agents, which all provide a high degree of passivation. The resin consists of a water-based emulsion of organic polymers.

WHERE TO USE

MCI®-2023 is recommended to protect steel reinforcing prior to restoration with MCI® or other repair mortars. It is especially useful in areas with little concrete coverage of the reinforcing steel, which are subject to deicing salts and carbonation attack.

ADVANTAGES

- Offers engineers, owners, contractors, DOTs and government agencies a time-proven corrosion inhibiting technology that will extend the life of reinforced concrete structures
- Applies quickly and easily by brush
- Has excellent adhesion to the substrate along with excellent durability
- Provides protection to the reinforcing steel from oxidizing agents
- Has the ability to migrate through concrete structures and seek out the steel reinforcing bars and other metal members embedded in the concrete
- Once cured, MCI®-2023 becomes water-repellent and forms an effective barrier against the penetration of water soluble salts

COVERAGE

Approximate coverage per 2.5 gal (9.4 L) kit is 60 ft^2 at a thickness of $^1/_{16}$ inch (5.6 m^2 at a thickness of 1.6 mm) or 120 ft^2 at a thickness of $^1/_{32}$ inch (11.1 m^2 at a thickness of 0.8 mm). When applied in thicknesses greater than $^1/_{32}$ - $^1/_{16}$ inches (0.8-1.6 mm), consumption increases, but there are no adverse effects as long as the subsequent coats are applied when the previous coat is thoroughly dry.

SURFACE PREPARATION

Remove all loose rust from rebar by sandblasting, water blasting or wire brush. The surface should be dry before applying the grout.

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

APPLICATION

Mix sufficient amounts of resin and powder together until smooth and free of lumps. Apply to rebar immediately after mixing (no later than 30 minutes). To protect cleaned reinforcing steel, brush on grout immediately before restoration with MCI® or other repair mortars. If more than one coat of grout is used, make sure first coat is thoroughly dry before applying second coat. If there is an interval between applying the initial protection and the structural restoration, apply another coat on top of the hardened grout immediately before applying the mortar.

LIMITATIONS AND STORAGE

- The emulsion polymers turn into a film at temperatures above 42-43°F (5-6°C). It is not advised to use the product in colder temperatures
- Do not let the resin for MCI®-2023 Passivating Grout freeze
- Keep powder in its original container and ensure that it is always well sealed

TYPICAL PROPERTIES

Appearance	Concrete gray when mixed
Shelf Life	Powder 6 months, Liquid 1 year in an unopened package
Mixing Ratio	Plant-proportioned kit
Storage	Keep from freezing

PACKAGING

26.5 lb. (12 kg) bag of passivating grout powder with 11 lb. (5 kg) pail passivating grout resin. One kit of powder and resin yields approximately 2.5 gallons (9.4 liters).

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 5/14/07. Cortec Corporation 1997-2007. All rights reserved. Supersedes: 2/13/07.

MCI®-2026 Floor Coating

PRODUCT DESCRIPTION

MCI-2026 Floor coating is a 100% solids, 2-component, novolac epoxy coating designed for environments that require a high degree of chemical or temperature resistance. MCI-2026 Floor coating meets all of the USDA guidelines for use in federally inspected poultry and meat plants. MCI-2026 Floor coating is available in clear, and can be colored with any of the MCI-2026 HPCS colorants.

RECOMMENDED USES

MCI-2026 Floor coating is recommended as a high performance coating in areas that are subjected to heavy traffic, chemical spillage, and/or elevated temperatures.

FEATURES

- 100% solids
- Solvent-free
- Odorless
- Extensive range of colors using MCI-2026 HPCS colorants
- Gloss finish
- Can be made anti-slip
- VOC compliant
- Excellent Chemical Resistance
- Good Abrasion Resistance
- Single or multiple coat application
- No induction time

SURFACE PREPARATION

The substrate must be clean, dry, and sound with new concrete cured for at least 30 days at 70°F (21°C). Remove dust, laitance, grease, curing compounds, waxes, foreign particles, disintegrated or soft base materials, and any previously applied potentially incompatible coatings. Create a surface profile on concrete by either steel shot blasting or acid etching.

FOR BEST RESULTS

- For interior use only
- New concrete must cure for at least 30 days at 70°F (21°C)
- Do not thin the MCI-2026 Floor coating
- Do not use when Humidity Exceeds 75% indoors
- Do not allow material to puddle during application
- Allow each coat to dry tack-free before recoating
- Allow each coat within 24 hours of previous coat
- Discard any material subjected to freezing
- Do not apply to structurally unsound surfaces
- Prime bare concrete with MCI-2026 Primer
- Apply a test patch to ensure adhesion to old paint

PRIMING

For optimum results, prime the prepared concrete floor first with MCI-2020 inhibitor and MCI-2026 Primer. They can be applied at the rate of 250-300 sq. ft. per gallon (6.14-7.36m^2/L). On rougher areas and shot-blasted floors, the coverage rates will be reduced to about 225-250 sq. ft. per gallon (5.52-6.14m^2/L).

Allow the MCI-2026 Concrete Primer to dry thoroughly before mixing and applying the next coating. The primed floor should be tack-free and clear in appearance. This will vary with temperature and humidity but is normally between 2-5 hours at 75°F (24°C) and 50% R.H.

MIXING

Avoid mixing and application of this product if the floor temperature is below 55°F (13°C) or above 85°F (29°C). Also avoid application if the humidity is higher than 75% R.H. The temperature of the floor, materials, and air in the area of the installation all play a role in how the product will apply and cure. For 0.6 gallon (2.27L) and 2.5 gallon (9.5L) units: carefully pour entire contents of Part A container into Part B container.

Blend thoroughly for 3 to 5 minutes with a spiral mixing blade attached to a low-speed (400-600 rpm) electric drill. Take care not to induce air into the material when mixing. This will cause "bubbles" in the coating when applied. For bulk units: portion out 1 gallon (3.8L) of Part A and 1.5 gallons (5.7L) of Part B into a clean 5 gallon (19 L) pail. Blend in accordance with directions stated above.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

COVERAGE

This product should be applied at the rate of approximately 125-150 sq. ft per gallon (3.06 m^2/L), which is between 11 to 13 wet mils (279.4-330.2μm/y wet). As with all coatings coverage is dependent on the smoothness and porosity of the surface.

APPLICATION

The recommended application of this product involves pouring it in a narrow line directly onto the concrete surface and then spreading it with a squeegee. Spread the coating in a continuous manner from one side of the area being coated to the other. Immediately follow with a 3/8" (0.95cm) nap shed resistance roller. The MCI-2026 Floor coating must be rolled as evenly as possible. To do this, roll forward in a straight line and then roll the same column backwards to eliminate spike shoe marks. Overlap the next column to be rolled by 1/2" (1.27cm) with the previously rolled column. Avoid excess agitation of the liquids with the roller. This will lessen chances of bubbling of the final film. The individual(s) applying the MCI-2026 Floor coating should be wearing "spiked sandals".

POT LIFE

At 70°F (21°C) and 50% R.H. the MCI-2026 Floor coating has a useful working time or pot life of approximately 25 minutes. Using any product beyond this time will result in variable results and therefore any mixed product beyond the pot life should be discarded.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

PHYSICAL PROPERTIES

Property	Typical Values
Shelf Life	2 years
Application Temperature and Humidity	55°F (13°C) to 85°F (29°C) at less than 75% R.H.
Mixing Ratio (A to B)	Clear: 1 to 1.5 by volume, 1 to 1.7 by weight Gray: 1 to 1.57 by volume, 1 to 1.9 by weight
Coverage	125-150 sq. ft per gallon
Working Time	25 minutes at 70°F (21°C)
Application Method	Straight squeegee and 3/8" (0.95 cm) nap roller
Ready For Recoat	6-8 hours
Ready for Foot Traffic	12-18 hours
Ready for Heavy traffic	24+ hours
Bond Strength	400 + psi w/ concrete failure (ASTM D-4541)
% Solids by volume	100% (ASTM D-1464)
Flash Point, PMCC	>200°F (93°C)
UV Light Resistance	Very Good (QUV)
Hardness (Shore D)	82+ (ASTM D-2240)
VOC	12 g/l (EPA Method 24)
Gloss (60°)	90+
Impact Resistance	>160 in-lbs (ASTM D-2794)
Indentation	None (MIL-D-3134F)
Abrasion Resistance	0.08 g (ASTM D-4060, CS-17 wheel)
Flammability	Self-Extinguishing (ASTM D-635)
Heat Resistance Limitation	180°F (82°C) Constant; 212°F (100°C) Intermittent
Water Absorption	0.15% (ASTM C-413)
Coefficient of Friction	0.72 (ASTM F-609)
Part A WPG	8.6-8.9 lb/gal (1.03-1.07 kg/l)
Part B WPG	9.6-9.9 lb/gal (1.15-1.18 kg/l)

PACKAGING

Size	Packaging	Ship Wt	Description
2.5 gal (9.5L)	Large one batch unit	26.2 lbs (12.1 kg)	One gallon hardener container plus 1.5 gal resin container packaged in a single carton
12.5 gal (47.3L)	3 x 5 gal pails bulk unit	136 lbs (61.69 kg)	One 5 gal pail of hardener and Two 5 gal pails of resin
138.0 gal (522.3L)	3 x 55 gal bulk unit	1,490 lbs (675.82 kg)	One 55 gal drum of hardener and Two 55 gal drums of resin

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer

MCI®-2026 Primer HS

PRODUCT DESCRIPTION

MCI-2026 Concrete Primer HS coating is a proprietary water-based, 2-component, epoxy coating system that outperforms and outlasts most solvent-based sealer systems without the associated odors, flammability, or VOC's. MCI-2026 Concrete Primer HS coating meets all of the USDA guidelines for use in federally inspected poultry and meat plants. MCI-2026 Concrete Primer HS coating is available in clear and can be colored using MCI-2026 HPCS colorants. MCI-2026 Concrete Primer HS coating can be used as a part of MCI-2026 flooring system or as a top coat.

RECOMMENDED USES

MCI-2026 Concrete Primer HS is the recommended primer for most MCI-2026 Flooring Systems. It is also recommended as a stand alone coating in areas that are subjected to medium to heavy traffic and moderate chemical spillage.

FEATURES

- Waterborne
- Solvent-free
- Odorless
- Fast drying time
- Easy Mixing Ratio
- Applies to damp concrete
- VOC compliant
- Moderate chemical resistance
- Good abrasion resistance
- Eliminates concrete dust
- Excellent adhesion
- No induction time
- Good mar resistance
- Cleans easily

COVERAGE

This product should be applied at the rate of approximately 250-350 sq. ft per gallon (6.14-8.60m^2/l), which is between 6.4 to 4.6 wet mils (163-116.84 μm wet). As with all coatings, coverage is dependent on the smoothness and porosity of the surface. As a primer, the coverage rate should be 250 sq.ft. per gallon (6.14m^2/l).

SURFACE PREPARATION

The substrate must be clean, dry, and sound with new concrete cured for at least 30 days at 70°F (21°C). Remove dust, laitance, grease, curing compounds, waxes, foreign particles, disintegrated or soft base materials, and any previously applied potentially incompatible coatings. Create a surface profile on concrete by either steel shot blasting or acid etching.

FOR BEST RESULTS

- For interior use only
- New concrete must cure for at least 30 days at 70°F (21°C)
- Do not thin the MCI-2026 Concrete Primer HS coating
- Do not use when Humidity Exceeds 70% indoors
- Do not allow material to puddle during application
- Allow each coat to dry tack-free before recoating
- Allow each coat within 24 hours of previous coat
- Discard any material subjected to freezing
- Do not apply to structurally unsound surfaces
- Do not apply heavier than recommended wet film thickness
- Apply a test patch to ensure adhesion to old paint

MIXING

Avoid mixing and application of this product if the floor temperature is below 55°F (13°C) or above 85°F (29°C). Also avoid application if the humidity is higher than 70% R.H. or lower than 25%. The temperature of the floor, materials and air in the area of the installation all play a role in how the product will apply and cure.

For 3/4 gallon (2.8L) and 3 gallon (11.36L) units: carefully pour entire contents of Part B container into Part A container. Do not change the ratio of A and B. Blend thoroughly for 3 to 5 minutes with a spiral mixing blade attached to a low-speed (400-600 rpm) electric drill. Take care not to induce air into the material when mixing. This will cause bubbles in the coating when applied.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

For bulk units: portion out 2 gallons (7.57L) of Part A and 1gallon (3.785L) of Part B into a clean 5 gallon (19L) pail. Blend in accordance with directions stated above.

APPLICATION

The recommended application of this product involves pouring it in a narrow line directly onto the concrete surface and then spreading it with a squeegee. Spread the coating in a continuous manner from one side of the area being coated to the other. Immediately follow with a 3/8" (0.95cm) nap shed resistance roller. The MCI-2026 Concrete Primer HS coating must be rolled as evenly as possible. To do this, roll forward in a straight line and then roll the same column backwards to eliminate spike shoe marks. Overlap the next column to be rolled by 1/2" (1.27 cm) with the previously rolled column. Avoid excess agitation of the liquids with the roller. This will lessen chances of bubbling of the final film.

POT LIFE

At 75°F (24°C) and 50% R.H. the MCI-2026 Concrete Primer HS has a useful working time or pot life of approximately 30-40 minutes. Using any product beyond this time will result in variable results and therefore any mixed product beyond the pot life should be discarded.

PHYSICAL PROPERTIES

Property	Typical Values
Shelf Life	2 years
Application Temperature and Humidity	55°F (13°C) to 85°F (29°C) at less than 70% R.H.
Mixing Ratio (A to B)	Clear: 2 to 1 by volume, 1.8 to 1 by weight Gray: 2 to 1 by volume, 2 to 1 by weight
Coverage	250-350 sq ft per gallon
Working Time	35 minutes at 75°F (24°C)
Application Method	Straight Squeegee and 3/8" Nap Roller
Ready for recoat	2-5 hours
Ready for Foot Traffic	7-12 hours
Ready for Heavy Traffic	24+ hours
Bond Strength	400+ psi w/ concrete failure (ASTM D-4541)
% Solids by volume	52% (ASTM D-1464)
Flash Point, PMCC	>200°F (93°C)
UV light Resistance	Good (QUV)
Hardness (Shore D)	80+ (ASTM D-2240)
VOC	11g/l (EPA Method 24)
Gloss (60)	75 (50 Satin)
Impact Resistance	>160 in-lbs (ASTM D-2794)
Indentation	None (MIL-D-3134F)
Abrasion Resistance	0.06 g (ASTM D-4060, CS-17 wheel)
Flammability	Self-Extinguishing (ASTM D-635)
Heat Resistance Limitation	140F (60C) Constant; 200F (93C) Intermittent
Water Absorption	0.2% (ASTM C-413)
Coefficient of Friction	0.77 (ASTM F-609)
Part A WPG	9.4-9.8 lb/gal (1.13-1.18 kg/l)
Part B WPG	8.5-8.8 lb/gal (1.02-1.05 kg/l)

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

PACKAGING

Size	Packaging	Ship Wt	Description
0.75 gal (2.8 L)	Small one batch unit	8.4 lbs (3.8 kg)	One hardener container and one resin container , packaged in a single carton
3.0 gal (11.36 L)	3 gallon kit	30 lbs (13.61 kg)	One bag of hardener and one bag of resin, packaged in a mixing/shipping pail, with tear strip lid
15.0 gal (56.8 L)	3 x 5 gal pail bulk unit	140 lbs (63.51 kg)	One 5 gal pail of hardener and Two 5 gal pails of resin
165.0 gal (624.5 L)	3 x 55 gal drum bulk unit	1600 lbs (725.87 kg	One 55 gal drum of hardener and Two 55 gal drums of resin

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer

MCI®-2027 Aliphatic Polyurea Coating

PRODUCT DESCRIPTION

MCI-2027 is a single component, 90% solids, UV-stable, VOC Compliant, Aliphatic Polyurea that was developed for high gloss floor topcoats, chemical resistance, and corrosion control. This coating provides reliable performance in a wide range of temperatures and climate conditions. MCI-2027 has excellent resistance to UV rays, abrasion, and many of today's harshest chemicals.

ADVANTAGES

- Displays excellent adhesion characteristics to a variety of substrates / coatings.
- Unlimited pot life increases the workability of the coating, providing consistent aggregate broadcasts and uniform topcoat applications.
- Will provide a glossy smooth finish when cured.
- Coating displays excellent chemical and abrasion resistance.
- Emits virtually no odors and can be applied indoors with minimal disturbance to surrounding activities.
- VOC FREE
- 100% UV-Stable Aliphatic Chemistry
- Versatile, crystal clear topcoat for use on both horizontal and vertical applications.
- Can be used for immersion and non-immersion service.
- Single component means no possible mixing errors, thus eliminating the human error factor.
- Extended cure time delivers great self-leveling properties and glass-smooth finishes.

PRIMARY APPLICATIONS

- Heavy traffic areas
- Aircraft hangar floors
- Maintenance facilities
- Offshore platforms
- Industrial shop floors
- Commercial kitchens
- Bathrooms and Lavatories
- Chemical manufacturing plants
- Wastewater treatment applications
- Bar, table, and countertop sealer

TYPICAL PHYSICAL PROPERTIES

PROPERTY	TEST	RESULT
Tensil Strength	ASTM D412	5500
Compressive Strength (psi Mpa)	ASTM D695	12000
Elongation	ASTM D412	75
Tear Strength	ASTM 2240	800
Hardness Shore D	ASTM 2240	80
Flexibility 1/8" Mandrel	ASTM D1737	Pass
Falling Sand Abrasion Resistance *Liters sand/1dry mil	ASTM D968	30
Abrasion Resistance CS-17 Wheel gm Load	ASTM D4060	12 gm Loss/ 500 cycles
Gloss	ASTM D523	+91

COVERAGE

Recommended Coverage

Topcoat Over Full Chip 150-250 sf/gal @8.0 mils DFT (3.69 - 6.15 m2/L @200 mic)
Topcoat Over Solid Color 400-700 sf/gal @3.2 mils DFT (9.83 - 17.20 m2/L @80 mic)
Topcoat Over Quartz 125-200 sf/gal @8.3 mils DFT (3.07 - 4.92 m2/L @207.5 mic)
VOC compliant in all 50 states and Canada

Single Component	72°F (24°C)
	TACK FREE-1-2 hrs
Relativity Humidity	54% Hard dry-3-6 hrs
Recoat Minimum -	4 hours
Recoat Maximum – 1	2 hours
Coverage:	1,600 square feet, per gallon, per mil. ($39.3\ m^2/L$ @25 mic)

ADHESION RESULTS WITH PERFORMANCE DATA

ASTM D-4541 Elcometer
Concrete-no primer concrete failure >500psi
Concrete-primer concrete failure >550psi
Steel- primer shear failure >2000psi

CHEMICAL RESISTANCE WITH PERFORMANCE DATA

Acetic Acid 100%	RC
Acetone	R
Ammonium Hydroxide 50%	RC
Benzene	RC

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

Brake Fluid	R
Brine saturated H2O	R
Chlorinated H2O	R
Diesel fuel	R
Ethanol	R
Gasoline	R
Gasoline/5% MTBE	R
Gasoline/5% Methanol	R
Hydrochloric Acid 20%	R
Hydrofluoric Acid 10%	RC
Hydraulic fluid (oil)	R
Isopropyl Alcohol	R
Jet Fuel (JP-4)	R
Lactic Acid	RC
MEK	R
Methanol	R
Methylene Chloride	C
Mineral Spirits	R
Motor Oil	R
MTBE	C
Muriatic Acid 10%	R
NaCl/H2O 10%	R
Nitric Acid 20%	RC
Phosphoric Acid 10%	R
Phosphoric Acid 50%	NR
Potassium Hydroxide 10%	R
Potassium Hydroxide 20%	R, Dis
Propylene Carbonate	RC
Skydrol	RC
Sodium Hydroxide 25%	R
Sodium Hydroxide 50%	R. Dis
Sodium Hypchlorite 10%	R
Sodium Bicarbonate	R
Stearic Acid	R
Sugar/H20	R
Sulfuric Acid 10%	R
Sulfuric Acid >50%	R
Toluene	R
1, 1,1-Trichlorethane	C
Trisodium Phosphate	R
Vinegar/H2O 5%	R
H2O 14 days at 82°	C R
Xylene	R

CHEMICAL RESISTANCE KEY

R=recommended/little or no visible damage

RC=recommended conditional/some effect, swelling, or discoloration

C=Conditional/Cracking-wash within one hour of spillage to avoid affects

NR=Not recommended

Dis=Discolorative

SURFACE PREPERATION

Concrete

Old concrete - Sandblasting, shot blasting, diamond grinder w/30 grit or coarser, or water blasting is highly recommended to remove surface contaminants. Any oils or fats must be removed prior to product application. Do not apply to wet substrates. Chloride, moisture and pH levels should be checked prior to application.

New Concrete – The concrete should be allowed to cure for a minimum of 28 days. Shot-blasting, sand blasting, diamond grinder w/30 grit or coarser or acid etching is required to remove the surface laitance that appeared during the curing process. A primer can be used to reduce out gassing and promote adhesion.

Aluminum, Galvanized Steel, Non-Ferrous Metals

All metals must be prepared to a near white surface that is equivalent to SSPC 10 or NACE 2. For immersion service, a 3 mil blast profile is recommended. A 2 mil profile is generally accepted. MCI-2027 Primer, or VpCI-395 must be the primer used prior to applying MCI-2027 Top Coat.

Fiberglass

The gel coat must be abraded to allow a mechanical bond of the coating. Sanding using 40-60 grit sandpaper is generally acceptable. Remove all latent dust and clean the surface to be coated using a solvent such as MEK. MCI-2027 Primer or VpCI-395 should be used as the adhesive primer prior to applying MCI-Alphatic Polyuea Coating.

Existing Coatings

Cured coatings (beyond their re-coat windows) must be abraded via scuff sanding with 80-120 grit sandpaper prior to the application of MCI-2027. Wipe surface clean with a tack rag or similar after a thorough vacuuming to perform a final cleaning. DO NOT USE SOLVENTS TO CLEAN THE FLOOR.

Substrate Repairs

All spalls and cracks should be chased out and repaired to ICRI standards. Expansion joints should be honored.

APPLICATION

Please consult your Cortec Representative for job specific recommendations. In most cases the acceptable primers will be CORTEC MCI-2027 Primer, MCI-2026 Primer, or VpCI-395.

INSTALLATION RECOMMENDATIONS

Surfaces should be free of loose particles, rust, voids, and spalls. It is recommended that this product be applied multi-directional (north, south, east and west) to ensure proper coating thickness. ALWAYS FOLLOW THE DEW POINT CHART AND APPLY ACCORDINGLY. DO NOT APPLY IN DIRECT SUNLIGHT OR WHEN TEMPERATURES ARE STEADILY RISING. THIN MATERIAL WITH UP TO 15% MEK FOR TOPCOAT USE OVER 80°F (27°C)

TEMPERATURE

40°F - 100°F (4°C - 38°C)

Optimal installation temperature is 65°F -80°F (18°C -27°C). Extreme cold applications may slow the cure time.

APPLICATION INFORMATION

Mixing

Material should be pre-conditioned to a minimum of 50°F (10°C) prior to use. The material temperature must be brought to 5°F above the dew point temperature before opening and agitating the material to prevent condensation from entering the coating. Thoroughly mix the single component material using a paddle mixer and a drill for a minimum of 2 minutes to place the solids content evenly in suspension. This should be done prior to every use. CORTEC recommends pouring small amounts (1-2 gallons) into application containers to limit the amount of moisture introduced into the coating before being applied to the floor. Any unused material may be placed back in a separate, sealed storage container for future use.

DO NOT POUR UNUSED MATERIAL BACK INTO THE ORIGINAL SHIPPING CONTAINER AS IT COULD CONTAMINATE THE ENTIRE BATCH. Seal all containers immediately after pouring out desired quantities. It is important to limit the time the container is open. Mix and pour out only what is needed. At the end of the day apply a solvent "float" of approximately 5 ounces of MEK over the surface of the coating before resealing the container.

Roller

Use only phenolic core, solvent resistant, natural, or synthetic fiber roller covers. ¼" to 3/8" nap are acceptable, thicker nap may cause bubbling of the coating.

Brush

Inexpensive natural fiber chip brushes are suggested – 2" to 4" width depending on the application. These will be one-time use items.

Thinner

MCI-2027 can be thinned using MEK up to 15% by total volume if required. DO NOT USE ANY OTHER KIND OF SOLVENT.

Clean Up

Use ACETONE or MEK to clean tools, etc. before product cures.

APPLICATION CONDITIONS

Shelf Life and Storage

Twelve (12) months in factory delivered unopened buckets. Keep away from extreme heat, cold and moisture. Maintain at a proper storage temperature of 50-90° F. Keep out of direct sunlight and away from fire hazards.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Repairs and Maintenance

Re-application of the product after 12 hours of initial application requires sanding and cleaning to achieve optimum adhesion. Contact CORTEC for site specific recommendations.

COMPATIBLE COATINGS

Primers

MCI-2026 Primer
MCI-2027 Primer
VpCI-395

CERTIFICATIONS

VOC Compliant in all 50 states, Canada, Australia and Various Countries in Europe (National Standards – IMC) USDA and FDA certified food safe for incidental food contact.

SAFETY PRECAUTIONS

DANGER!! Vapor and Atomized liquids are harmful. Overexposure may cause lung damage, allergic skin reactions, or respiratory reactions. Effects may be permanent, may affect the brain or nervous system causing dizziness, headaches, or nausea. Use only in well ventilated areas, wear approved respirators when necessary. Keep out of reach of children. See MSDS for First Aid recommendations.

PACKAGING

Product is sold CLEAR. Contact CORTEC for available colors and mixing ratios. Available in 2 gallon green pails.

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI® MCI® Technologies

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

printed on recycled paper 100% post consumer

MCI®-2039

High Performance Repair Mortar System

PRODUCT DESCRIPTION

MCI-2039 is a single-component, fiber-reinforced repair mortar containing Migratory Corrosion Inhibitors (MCI®), fibers, and polymers. After mixing, the mortar can be applied by trowel and normal rendering tools.

Once applied and hardened, MCI-2039 provides a high level of adhesion, durability, and impermeability to water and carbonation attack. Part of Cortec's HPRS® (High Performance Repair System), MCI-2039 also has a low modulus of elasticity. It offers excellent corrosion protection to reinforcing metals in the patch area as well as in the surrounding area. This increases the quality and extends the life of the repair and surrounding structure.

TYPICAL USES

MCI-2039 is recommended for:

- All reinforced, precast, prestressed, post-tensioned, or marine concrete structures
- Steel-reinforced concrete bridges, highways, and streets exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- Parking decks, ramps and garages
- Concrete piers, piles, pillars, pipes, and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures

FEATURES

- Offers engineers, owners, contractors, DOTs, and government agencies a time-proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures
- Provides the answer to difficult repairs or restorations on smooth substrates where good adhesion is difficult to achieve or where high buildup is required
- Thixotropic qualities and accelerated thickening capabilities ensure quick application of multiple coats and reduction of labor costs
- High durability against carbonation, chlorides, and acid rain
- Migratory Corrosion Inhibitors form a protective layer on metals and migrate to adjacent areas to protect surrounding metals
- Reduces the halo or ring effect around the repair
- High degree of impermeability, while maintaining good vapor transmission properties

PACKAGING

MCI-2039 is packaged in a 55 lb (25 kg) bag.

One bag of powder yields approximately 3.5 gallons (13.4 liters).

COVERAGE

A 55 lb (25 kg) bag of powder can cover a 12 ft^2 (1.12 m^2) surface at a thickness of $^1/_2$ inch (12.7 mm). Volume = 0.5 ft^3 (0.014 m^3)

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

SURFACE PREPARATION

Remove all loose deteriorated concrete, including all dirt, oil, greases, and bond-inhibiting materials from surface. Cortec® MCI-2060 is recommended for cleaning. If the steel or metal members are exposed and rusted, remove loose rust by sandblasting, water blasting, + or wire brush and apply MCI-2023 Passivating Grout. Alternatively, CorrVerter VpCI could be used on rusted rebars before applying MCI-2039.

MIXING

Add MCI-2039 powder to 0.8-0.9 gallons fresh water, stirring at 400-600 rpm with a mixer for 3-5 minutes. Should the mixture need to be particularly thick and cohesive, slightly reduce the quantity of water. If the mortar needs to be more fluid, water may be slightly increased. Prepare only the amount of mixture that can be used within 30 minutes. Do not reuse the product or thin with further liquid after the mortar has thickened.

APPLICATION

Apply MCI-2039 directly to the area requiring repair by trowel and normal rendering tools. To improve adhesion on surfaces that normally provide poor surface bonding, brush the surface with a fluid version of the mortar using a stiff bristled brush. If the repair area requires greater than $^{3}/_{8}$-2½ inches (10-64 mm), mortar should be installed in several layered applications up to a maximum thickness of 8-12 inches (203-305 mm). In case of thick applications on large surfaces, use wire mesh or netting properly anchored to the structure for additional support. Once applied, MCI-2039 thickens quickly. Finishing the surface in a short time is important.

APPLICATION CONSIDERATIONS

- Keep powder in its original wrapping and ensure that it is always well sealed
- Do not use opened bags of powder that are caking or have lumps present
- Do not apply when surface or ambient temperature is expected to be below freezing or over 125°F (50°C) within 12 hours

TYPICAL PROPERTIES

Appearance	Concrete gray when mixed
Shelf Life	1 year in sealed package
Mixing Ratio	0.8-0.9 gal of fresh water per bag
Storage	Keep from freezing
Application time	30-45 minutes after addition of water @ 65-75°F (17-23°C)

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

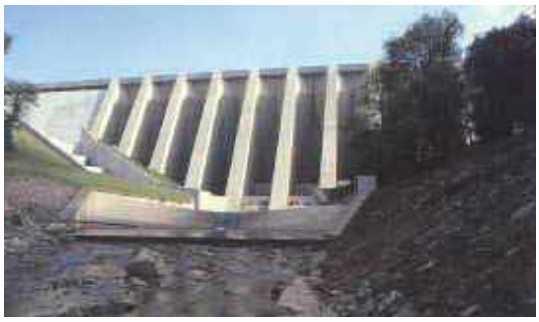
Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer

MCI®-2120 Concentrate



DESCRIPTION:
MCI-2120 is a concentrated product designed to be diluted 1:3 with potable water. Once diluted, MCI-2120 is designed to be used as a surface applied, migrating corrosion inhibitor that penetrates through cementitious materials including concrete, mortar, and limestone. MCI-2120 migrates in both liquid and vapor (gas) phases through the pore structure, forming a protective, molecular layer on embedded reinforcement. MCI-2120 provides corrosion protection against carbonation, chlorides, and other contaminants.

HOW IT WORKS:
MCI-2120 contains organic corrosion inhibitors, which provide ambiodic (mixed) inhibition to protect both anodic and cathodic areas within a corrosion cell. MCI-2120 contains a synergistic blend of amine salts and carboxylic acids which form a protective layer on embedded reinforcement delaying the onset of corrosion as well as reducing existing corrosion rates.

WHERE TO USE:
MCI-2120 Concentrate is recommended for:
- Preventative maintenance of existing reinforced, precast, prestressed, post-tensioned, or marine concrete structures
- Bridges, highways and industrial floors exposed to aggressive environments (chemicals, deicing salts, carbonation, and atmospheric attack).
- Parking garages
- Concrete piers, dams, offshore platforms, piles, pillars, pipes, utility poles, and cooling towers
- Concrete potable water structures
- As a component of Cortec's High Performance Repair System® (HPRS®).

ADVANTAGES:
MCI-2120 offers engineers, owners, contractors, DOTs, and other government agencies a time proven, corrosion inhibiting technology that will extend the service life of their reinforced concrete structures.
- Protects against corrosion caused by carbonation, chlorides, and other aggressive contaminants
- Effectively reduces corrosion rates on metals with existing corrosion
- ANSI/NSF Standard 61 Approval for structures containing potable water
- Water based and non-flammable
- Does not etch glass
- Does not contain calcium nitrite
- Does not contain wax
- Does not require removal of sound concrete
- Allows vapor diffusion (not a vapor barrier)
- Easily applied by spray, brush, or roller
- Minimal curing time, traffic may resume minutes after application if necessary
- Migrates independently of orientation (horizontal, vertical, overhead)
- Migrates up to 3 inches in 30 days
- Proven performance in both lab and field testing

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

PHYSICAL PROPERTIES:

MCI-2120:

Appearance:	Clear, slightly yellow to amber colored liquid
pH:	9.5-10.5 (1% aqueous)
Density:	8.9-9.2 lb/gal (1.07-1.10 kg/l)
Shelf Life:	24 months in sealed container
STORAGE:	32°F (0°C)-150°F (60°C) DO NOT FREEZE

MCI-2120
(after 1:3 dilution with potable water):

Appearance:	Clear, yellow, viscous liquid
pH:	9.0-10.0 (1% aqueous)
Density:	8.4-8.6 lb/gal (1.01-1.03 kg/l)
STORAGE:	32°F (0°C)-150°F (60°C) DO NOT FREEZE

COVERAGE:

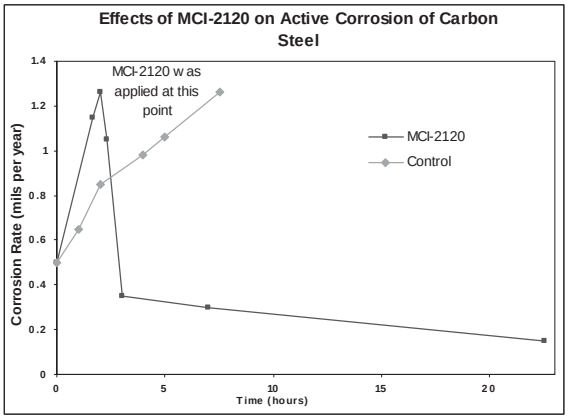
MCI-2120 is applied in a single coat at 150 ft^2/gallon (3.68 m^2/liter) to horizontal surfaces. It is applied in two coats at 300 ft^2/gallon (7.36 m^2/liter) to vertical and overhead surfaces.

PACKAGING:

MCI-2120 Concentrate is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, and 275 gallon (1040 liter) totes.

PERFORMANCE DATA:

The graph below displays the reduction in corrosion rate after the addition of MCI-2120 in a 2.0% sodium chloride solution.



SURFACE PREPARATION:

Surfaces should be dry, clean and free of all oil, grease, efflorescence, water repellants, coatings, membranes, and asphalt. Cleaning may be done by steam cleaning, waterblasting, or sandblasting.

APPLICATION:

Apply MCI-2120 by spray (conventional airless or hand pressure spray equipment), brush or roller according to coverage rates listed above. If applying more than one coat, allow the surface to dry enough between applications so that the second coat penetrates into the surface within 15 minutes. When applying a water repellant, coating, repair mortar or overlay over MCI-2120, the surface should be rinsed with water, pressure washed or blast-cleaned to remove any residue unless prior adhesion testing has been performed. Consult product specifications for more detailed application instructions.

CONSIDERATIONS:

- Substrate and ambient temperature should be above 35°F (2°C) and below 125°F (50°C)
- Do not apply if temperature is expected to fall below 32°F (0°C) within 12 hours after application
- MCI-2120 will not penetrate water repellants, coatings, paints, membranes, or asphalt
- If structure will be submerged after application of MCI-2120, it is recommended to use a waterproofing coating over MCI-2120 prior to submersion
- Maximum chloride content at the depth of reinforcement in structures being treated with MCI-2120 is 6 lb/yd^3 (3.5 kg/m^3). For higher levels, consult Cortec technical service

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 2/22/11. Cortec Corporation 1999-2011. All rights reserved. Supersedes: 12/26/06.

MCI®-2241/MCI®-2242 Watertight Coat

PRODUCT DESCRIPTION

MCI® -2241/2242 are flexible and breathable waterproofing membranes based on a unique combination of acrylic emulsion, Portland cement and fine fibers. Use them to waterproof all types of above- or below-grade concrete and masonry including foundations, block walls, balconies, parapets, planter boxes, water ranks, and fountains. MCI®-2241 is a gray color, MCI®-2242 is white.

MCI®-2241/2242 Watertight Coat were designed for water-proofing above- and below-grade concrete and masonry. Their precise blend of acrylic emulsion, Portland cement and fine fibers makes them ideal for waterproofing a wide range of vertical or horizontal surfaces. This unique combination of ingredients creates a breathable waterproofing membrane that is both flexible and abrasion-resistant. Watertight coat can be used in combination with a variety of pedestrian or light traffic durable coatings offered by Cortec Corporation to achieve a highly durable, aesthetically pleasing waterproof horizontal finish system for concrete and masonry substrates.

SURFACE PREPARATION

Remove loose or damaged material by sand-blasting or high-pressure (>3000 psi (20.7 MPa)) water-blasting. Make sure surfaces are sound, clean and free of all bond-inhibiting materials, including oil, dust, dirt, laitance and standing water.

TYPICAL APPLICATIONS AND FEATURES

Features	Benefits
Acrylic-emulsion-based	Ensures bond to substrate; repels water; provides flexibility
Flexible	Bridges static hairline cracks
Breathable	Allows substrate to breathe naturally; can be used on grade
Fiber-reinforced	Provides improved tensile strength
Solvent-free	VOC compliant; environmentally friendly; tools clean up with water
Pre-measured packaging	Provides improved job-site quality control; adds convenience and efficiency to mixing

COVERAGE

Each kit covers 88-100 ft^2 when applied at 1/16 in thickness (8 m^2 per 15.2 L at 1.6 mm thickness)

MIXING

Use both components at a preconditioned temperature of 70 +/- 5^0F (21 +/- 3^0C). Use one 2.3 gal pail (8.9 L) of Component A per one 25 lb. bag (11 kg) of Component B. Alternatively, batch mix in 1/2 units.

Mixing must be achieved mechanically using a slow-speed drill and a mixing paddle. Mix thoroughly for at least 3 minutes to a uniform, lump-free consistency. Once mixed, the working time is approximately 30-90 minutes, depending upon material, ambient and surface conditions.

APPLICATION

Apply only to sound and clean, dry, properly prepared, frost-free surfaces.

CORTEC CORPORATION
Environmentally Safe VpCI™/ MCI® Technologies

Apply in one 1/16 inch (1.6 mm) thick coat with a stainless-steel trowel. Alternately, apply to a 1/16 inch (1.6 mm) total thickness using a spray device. Immediately trowel the product level.

Use Repair Mesh to reinforce areas such as: static hairline cracks, transitions between materials (i.e., concrete floor to CMU wall or EIFS trim to stucco wall) and changes in plane (tops of knee walls and parapets). Immediately embed Repair Mesh into the material. Using a stainless-steel trowel, smooth out any wrinkles in the mesh forcing it down before covering it with MCI®-2241/2242.

Curing/Drying

Allow a minimum drying time of 24 hours before overcoating. Protect from rain, freezing, and continuous high humidity until completely dry.

Clean Up

Clean tools and equipment with water immediately after use. Cured material can only be removed mechanically.

LIMITATIONS

Apply only when surface and ambient temperature are 45-50^{0}F (7-10^{0}C) and rising or 85^{0}F (29^{0}C) and falling.

Mix Component A and Component B only in the specified ratios. Never add water to the mixture.

Cold or damp conditions retard drying and require additional time before overcoating or opening to traffic.

Not recommended for bridging joints or dynamic cracks in concrete or masonry.

Not recommended for roofing applications or as a primary waterproofing over occupied space.

Not recommended for use on wood decks or wood balconies.º

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

PHYSICAL PROPERTIES

Report	Test Method	Test Criteria	Results	Metric Equivalent
Adhesion to Concrete	ASTM D-4541	7 days 28 days	150 psi 177 psi	103 Mpa 1.22 Mpa
Tensile Strength	ASTM D-412	w/o mesh w/mesh	0.470 psi 3800 psi	3.24 Mpa 26.2 Mpa
Elongation	ASTM D-412	w/o mesh w/mesh	11.0% 9.0%	
Flexibility Mandrel Bend	ASTM D-522	28 days	passes 1/8" @ 77ºF	passes 3mm at 25ºC
Abrasion Resistance	ASTM D-4060 Taber CS-10 wheel	3000 cycles 6000 cycles		weight loss 0.20 g 0.34g
Water Absorption	ASTM D-570	24 hour immersion	4.5%	
Waterproofing (hydrostatic pressure)		Untreated CMU Water tight Coat	1.45 psi >101.5 psi	0.01 MPa 0.70 MPa
Vapor Permeability	ASM E-96 Procedure B (wet) Procedure A (dry)		3.9 U.S. perms 0.6 U.S. perms	220 ng/ Pa*m*s 33.1 ng/Pa*m*s
Chloride Ion Penetration	Modified NCHRP Report 244		89.9% reduction	
Rapid Chlordie Permeability	ASTM C 1202	Watertight Coat	550 Coulombs	

PACKAGING

MCI® -2241/2242 Component A is available in 2.3 gallons (8.9L) packaged in 5 gallon (19 liters) pail. Component B is available in 25 lb (11 kg) bags. Each kit yields 4 gallons (15 L). Shelf life is 12 months in original, properly stored, in unopened container.

Store in a dry area between 50^{0}F (10^{0}C) and 85^{0}F (29^{0}C). Protect from direct sunlight, extreme heat, and freezing.

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION

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

printed on recycled paper 100% post consumer
Revised 11/02/06 Cortec Corporation 2006. All rights reserved. Supersedes: 3/27/06.

MCI®-2246
Bonding and Anticorrosion Agent

DESCRIPTION

MCI-2246 is a unique combination of portland cement, microsilica, epoxy, and acrylic resin. Use it for bonding new concrete or mortar to old and for protecting reinforcing steel against rust and corrosion. When used as a bonding agent, it provides up to a 24-hour open time.

MCI-2246 provides an easier way to bond cement-based materials and to protect reinforcing steel against corrosion. Its two components are field batched. Mixed by drill and paddle, its fluid consistency can be sprayed on easily, increasing job-site productivity.

SURFACE PREPARATION

Bonding Agent

Remove loose and deteriorated materials by shot- or sand-blasting, or mechanical means to obtain a fractured aggregate surface. Make sure surfaces are sound, clean, and free of all bond-inhibiting materials including oil, dust, dirt, laitance, and standing water.

Anticorrosion Agent

Remove rust or active corrosion using sandblasting or mechanical wire brushing to produce a white metal finish. Make sure surfaces are clean, dry, and free of all bond-inhibiting materials including oil, dust, and dirt. MCI-2246 must be applied immediately after cleaning of reinforcing steel to avoid new corrosion.

MIXING

Use both components of MCI-2246 at a preconditioned temperature of 70±5° F (21 ± 3° C). Use 1 gallon (3.8 L) jug of part A per 28 lbs (13 kg) bag of Part B.

Mixing must be achieved mechanically using a slow-speed drill and mixing paddle. Shake jug containing Part A. Pour all of liquid Part A into a clean, dry 5 gallon (19 L) mixing bucket. Mix while slowly adding the Part B powder, one third at a time. Continue mixing until all of the powder has been added. Mix thoroughly until Part A and B are evenly blended to a uniform color. Never add water to the mixture. Mix only sufficient material that can be used within its 90 minute pot life.

FEATURES AND BENEFITS

Features	Benefits
24 hour open time	Provides work schedule flexibility; can be used with formed or shotcrete repairs
Epoxy-, acrylic-based	Ensures bond to concrete and steel
Microsilica-enhanced	Increases bond strength; screens out chloride ions, protecting steel against corrosion
Non-vapor barrier	Allows concrete to breathe naturally; can be applied to on-grade concrete
Two components	Simple to use; mixing instructions easily understood
Sprayable	Easy to apply; speeds application time
20 mils as a bonding agent	Increases coverage; saves money
Field batched	No waste; mix only the amount needed
Water clean up	Tools can be reused; no hazardous solvents needed; environmentally friendly
VOC compliant	Use indoors with minimal ventilation
Non-flammable	Safe for workers

APPLICATION

Apply only to sound, clean, dry, properly prepared, and frost-free surfaces.

Bonding Agent

Dampen the area to be repaired so that the pores of the concrete are filled with water. Remove any ponding or glistening water on the surface (saturated surface dry/SSD).

Apply in one 20 mil (0.5 mm) coat with a hopper gun, pattern pistol-type spray equipment, or with a stiff-bristle brush.

Place fresh mortar or concrete while the MCI-2246 is still wet or within 24 hours.

As a bonding agent only, one 20 mil (0.5 mm) coat is required.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

Anticorrosion Agent
Brush on two 10 mil (0.25 mm) coats allowing 30-45 minutes between coats. Place fresh mortar or concrete after the MCI-2246 has dried to the touch or within 24 hours. The total thickness must be a minimum of 20 mils (0.5 mm).

Curing
Protect from direct sun or wind which may cause unwanted rapid surface drying.

Clean Up
Clean tools and equipment with water immediately after use. Cured material can only be removed mechanically.

APPLICATION CONSIDERATIONS
- Apply only when surface and ambient temperatures are 45°F (7°C) and rising or 85°F (29°C) and falling.
- Mix Part A and Part B only in the specified ratios. Never add water to the mixture.

Note: MCI-2246 dries in approximately 2 hours. Repair mortar/concrete must have sufficient flowability to "wet-out" the substrate in order to assure proper bonding of repair material.

YIELD
2.5 gal per unit (9.5 L)

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

TECHNICAL DATA

Report	Test Method	Criteria	Test Results
Pot Life			90
Open Time (hours)			24
Bond Strength (psi)	ASTM C-882 Plastic to hardened concrete	2 hrs. open 8 hrs. open 16 hrs. open 24 hrs. open	1,800 2,100 2,100 2,100
Tensile Strength (psi)	ASTM C-190	28 days	800
Flexural Strength (psi)	ASTM C-78	28 days	2,000
Rapid Chloride Permeability (Coulombs)	AASHTO T-277 ASTM C-1202	28 days	<150

*Typical values for material cured at 73°F (23°C) and 50% R.H.

Note: to convert psi to megapascal (Mpa) multiply by 0.0069

COVERAGE

Bonding Agent
70-80 ft^2 per gallon, applied at 20 wet mils (6-7 m^2 per 3.8 L, at 0.5 mm wet)

Anticorrosion Agent
70-80 ft^2 per gallon, applied at 20 wet mils (6-7 m^2 per 3.8 L, at 0.5 mm wet)

PACKAGING AND STORAGE
Store in a dry area, between 50°F (10°C) and 85°F (29°C). Protect from direct sunlight and extreme heat. MCI-2246 is available in a 2 part kit including Part A, a 1 gal jug (3.8 L) and Part B, a 28 lbs (13 kg) bag. Shelf life of the product is 12 months in original, properly stored container.

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer

MCI®-2311, Repair Mortar

DESCRIPTION

MCI®-2311 with Migrating Corrosion Inhibitor (MCI) is a single-component cement-based mortar for structurally repairing or overlaying deteriorated concrete. Developed with STO Corporation it is designed for use on horizontal surfaces for repairs from ½ to 4 inches (12 to 102 mm) or extend it with aggregate for deeper applications. Its formula provides increased strength gain and improved performance for repair applications.

MCI®-2311 provides the necessary concentration of MCI® (Migratory Corrosion Inhibitor) molecules on embedded steel bars. They create a protective monomolecular layer on metals embedded in concrete and inhibit further corrosion of bars.

HOW ITíS USED

MCI®-2311 with Migrating Corrosion Inhibitor is a one-component mortar that is ready to use; just add clean water. Once mixed by drill paddle or standard mortar mixer, its medium slump floats and consolidates easily. Use MCI®-2311 for repairs from 1/2 to 4 inches (12 to 102 mm) or extend it with aggregate for deeper applications.

SURFACE PREPARATION

Patching: Remove loose and deteriorated concrete by mechanical chipping or sand-blasting to obtain a fractured aggregate surface. Detail the edge of the patch to a 90° angle to eliminate feather edging. Make sure surfaces are sound, clean and free of all bond-inhibiting material including oil, dust, dirt, laitance and standing water.

Overlay: Remove loose and deteriorated concrete with a scabbler or by shot-blasting to obtain a fractured aggregate surface. Detail the edge of the overlay to a 90° angle to eliminate feather edging. Make sure surfaces are sound, clean and free of all bond-inhibiting material including oil, dust, dirt, laitance and standing water.

MIXING

Use MCI®-2311 at a preconditioned temperature of 70±5° F (21 ± 3° C).

Using Drill and Paddle: Mixing must be achieved mechanically using a slow-speed 3.4-inch (9 mm) drill and mixing paddle. Pour 5-6 pints (2.37-2.83 L) of water into a clean 5-gallon (19 L) mixing bucket. Mix while slowly adding the powder, one-third at a time. If more water is needed, up to one-half pint (.24 L) may be added. Mix up to 3 minutes, to a uniform, lump-free consistency. Avoid overmixing which could entrap air.

Mortar Mixer: Predampen thoroughly the inside of a clean mortar mixer, then remove any excess water. Pour 5.0-6.0 pints (2.37-2.83 L) of water per bag into the mortar mixer and slowly add all of the powder. If more water is needed, up to one-half pint (.24 L) per bag may be added.

Mix up to 4 minutes, to a uniform, lump-free consistency. Avoid overmixing which could entrap air. Once mixed the working time is 20-40 minutes depending upon material, ambient and surface conditions.

FEATURES AND BENEFITS

Features	Benefits
Low shrinkage	Stable bond line; resists perimeter cracking
Thermally compatible with concrete	Prevents delamination caused by temperature changes
High abrasion resistance	Stands up to abusive traffic
One-component	Ready-to-use; pumpable; easily mixed with water on job-site; no chemical jugs to dispose
Early recoat	Coatings may be applied 72 hours after application
Contains Migrating Corrosion Inhibitor (MCI)	Seeks out and forms a corrosion inhibiting protective layer on metals; Migrates to adjacent areas to protect metals around the repair area; Reduces the halo or ring effect surrounding the repair area

APPLICATION

Patching

Dampen the area to be repaired so that the pores of the concrete are filled with water. Remove any ponding or glistening water on the surface (saturated surface dry/SSD). Work a scrub coat of the mixed material into the substrate to ensure intimate contact and establish bond. Apply MCI®-2311 while the scrub coat is still wet. Consolidate it and trowel to desired finish.

NOTE: For application depths greater than 4 inches (102 mm), extend MCI®-2311 by adding 27 pounds (12 kg) of clean, uniformly graded 3.8-inch (9 mm) aggregate dampened to SSD condition. Consolidate it and trowel to the desired finish. Applications made during temperatures below 50° F (10° C) and above

CORTEC CORPORATION
Environmentally Safe VpCI™/ MCI® Technologies

80° F (27° C) should follow appropriate application guidelines.

Overlay

Follow application instructions for PATCHING.

Curing

Direct sun or wind may cause unwanted rapid surface drying. Curing may be accomplished by continuous water fogging for 48 hours or cover with damp burlap or burlene curing blankets. Do not use solvent-based curing compounds or allow water to puddle. If a coating or sealer will be applied, use water fogging or blanket curing methods and prep finished surface per manufacturer's recommendations.

Clean Up

Clean tools and equipment with water immediately after use. Cured materials can only be removed mechanically.

LIMITATIONS

- Apply only when the surface and ambient temperatures are 45-50° F (7-10° C) and rising. See Cold Weather Application guidelines, as per ACI for applications in temperatures less than 50° F (10° C). Applications made during temperatures greater than 85° F (29° C) should follow Hot Weather Application guidelines, as per ACI.
- Cold or damp conditions retard hydration and require additional time before coating or opening to traffic.
- The minimum required thickness is 1.2 inch (12 mm).
- Do not feather edge.
- Do not add more water than specified.
- Do not add additional powder from other units.
- Do not overmix.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

TECHNICAL DATA

Report	Test Method	Test Age	Test Results (Neat Mortar)	Test Results (Extended Mortar)
Compressive Strength (psi/Mpa)	ASTM C-109	1 day 7 days 28 days	3,500/ 24.15 5,500/ 37.95 7,000/ 48.30	
Compressive Strength (psi/Mpa)	ASTM C-39	1 day 7 days 28 days		3,200/22.08 4,800/33.12 6,000/41.40
Flexural Strength (psi/Mpa)	ASTM C-293	1 day 7 days 28 days	NT 1,100/ 7.59 1,150/ 7.94	NT 700/4.83 750/5.18
Splitting Tensile Strength (psi/Mpa)	ASTM C-496	7 days 28 days		425/2.93 600/4.14
Modulus of Elasticity (psi/Mpa)	ASTM C-469	28 days	3.7 million/ 25530	3.9 million /26910
Length Change	ASTM C-157	28 days	<0.065%	<0.030%
Direct Tensile Bond (psi/Mpa)	ASTM D-4541	28 days	260/ 1.79	210/1.45

*Typical values for material cured at 73°F (23°C) and 50% R.H.

YIELD

.40 ft^3 per 50 lb bag (0.0125 m^3 per 23 kg bag)

PACKAGING AND STORAGE

Store in a dry area, between 50° F (10° C) and 85° F (29° C). Protect from direct sunlight and extreme heat. MCI-2311 is available 50 lb bag (23 kg bag) Shelf life of the product is 12 months in original, unopened container.

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 products 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 THEREWITH. 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.

Distributed by:

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

MCI®-2701

PRODUCT DESCRIPTION

MCI-2701 with MCI (Migrating Corrosion Inhibitor) is a polymer-modified, cement-based mortar for structurally repairing or overlaying deteriorated concrete. Developed with Sto Corporation, this product is designed for use on horizontal or vertical surfaces for repairs from $^{1}/_{4}$ to 2 inches (6 mm to 51 mm) or extend it with aggregate for deeper horizontal applications.

MCI-2701 provides the proper concentration of MCI molecules necessary to create a protective monomolecular layer on metals embedded in concrete and inhibit further corrosion of bars.

MCI-2701 is a one-component, multi-purpose repair mortar that is ready-to-use; just add clean water. Once mixed by drill and paddle or standard mortar mixer, its medium-slump floats and consolidates easily. The acrylic polymer in the product provides a creamy consistency that can be finished easily without tearing the surface. Finish it smooth with a trowel or texture with a sponge float or broom.

FEATURES AND BENEFITS

Features	Benefits
Polymer-modified	Increases durability and freeze-thaw resistance; excellent adhesion; improves flexural strength
Low shrinkage	Stable bond line; resists perimeter cracking
Thermally compatible with concrete	Prevents delamination caused by temperature changes
Integral Corrosion Inhibitor	Protects embedded steel against corrosion
High abrasion resistance	Wears longer; stands up to abusive traffic
One component	Factory controlled polymer to cement ration; ready-to-use; easily mixed with water on the job site, no chemical jugs to dispose
Contains Migrating Corrosion Inhibitor (MCI)	Seeks out and forms a corrosion inhibiting protective layer on metals; migrates to adjacent areas to protect metals around the rpair area; reduces the halo or ring effect surronding the repair area

SURFACE PREPARATION

Remove loose and deteriorated concrete by mechanical chipping or sandblasting to obtain a fractured aggregate surface. Detail the edge of the patch to a 90° angle to eliminate feather edging. Make sure surfaces are sound, clean, and free of all bond-inhibiting materials including oil, dirt, dust, laitance and standing water.

MIXING

Use MCI-2701 at a preconditioned temperature of 70 ± 5°F (21 ± 3°C).

Use 6.0 to 6.5 pints (2.83 to 3.08 L) of water per 55-pound (25 kg) bag.

Mixing must be achieved mechanically using a slow-speed drill and mixing paddle. Pour 6.0 pints (2.83 L) of water into a clean 5 gallon (19 L) mixing bucket. Mix while slowly adding the powder, one-third at a time. If more water is needed, up to one-half pint (0.24 L) may be added.

Mix up to 4 minutes, to a uniform, lump-free consistency. Avoid overmixing which could entrap air. Once mixed, the working time is 25-45 minutes depending upon material, ambient, and surface conditions.

LIMITATIONS

- Apply only when the surface and ambient temperatures are above 45°F (7°C) . See Cold Weather Application guidelines, per ACI, for applications in temperatures less than 50°F (10°C). Applications made during temperatures greater than 85°F (29°C) should follow Hot Weather Application guidelines, per ACI.
- The minimum required thickness is 1/4 inch (6 mm).
- Application depths greater than 2 inches (51 mm) must be completed in lifts.
- Do not feather edge.
- Do not add more water than specified.
- Do not add additional powder from other units.
- Do not overmix.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

APPLICATION

Apply only to sound, clean, properly prepared, frost-free surfaces. Dampen the area to be repaired so the pores of the concrete are filled with water. Remove any ponding or glistening water on the surface (saturated surface dry/ SSD).

IMPORTANT: Work a scrub coat of the mixed material into the substrate to ensure intimate contact and establish bond. Apply MCI-2701 while the scrub coat is still wet.

Complete the repair while the scrub coat is still wet and trowel to the desired finish. MCI-2701 can be applied to a thickness of 2 inches (51 mm) in one lift. For application depths of up to 5 inches (127 mm) extend MCI-2701 by adding 27 pounds (12.2 kg) of clean, uniformly graded, $^{3}/_{8}$ inch (9 mm) aggregate dampened to SSD condition.

Applications made during temperatures below 50°F (10°C) or above 85°F (29°C) should follow appropriate application guidelines.

Curing

Direct sun or wind may cause unwanted rapid surface drying. Curing may be accomplished by continuous water fogging for 48 hours or cover with damp burlap or burlene curing blankets. Do not use solvent-based curing compounds. If a coating or sealer will be applied, use water fogging or blanket curing methods and prep finished surface per manufacturer's recommendations.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Clean Up

Clean tools and equipment with water immediately after use. Cured material can only be removed mechanically.

YIELD

0.50 ft^3 per 55 lb bag (0.014 m^3 per 27 kg bag).

COVERAGE

20-25 ft^2 per 55 lb bag, applied at ¼ inch thick (2 m^2 per 27 kg bag, at 6 mm thick).

TECHNICAL DATA

Report	Test Method	Critera	Test Results
Working time (minutes)			25-45
Compreshen-sive Strength (psi/Mpa)	ASTM C-109	7 days	7,000/48.3
		28 days	8,200/56.58
Flexural Strength (psi/Mpa)	ASTM C-293	7 days	1,2000/8.28
		28 days	1,500/10.35
Modules of Elasticity in Comprehession (psi/Mpa)	ASTM C-469	28 days	3.67 x 10^5/ 2.53 x10
Shrinkage (%)	ASTM C-157	7 days	.06
		28 days	.08
Rapid Chloride Permeability (Coulombs)	ASTM C-1202	28 days	820

Typical values for material cured at 73°F (23°C) and 50% R.H.

PACKAGING AND STORAGE

MCI-2701 is available in 60 lb bag (27 kg). The shelf life of the product is 12 months in original, unopened, properly stored container. Store in a dry area between 50°F (10°C) and 85°F (29°C). Protect from direct sunlight and extreme heat 90°F (32°C).

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 products 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 THEREWITH. 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.

CORTEC CORPORATION

Distributed by:

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

printed on recycled paper ♻ 100% post consumer
Revised 3/9/12. Cortec Corporation 2004-2012. Supersedes: 11/2/06.

MCI®-2702

PRODUCT DESCRIPTION

MCI®-2702 is a single component, polymer-modified, cement-based mortar for structurally repairing deteriorated concrete. Developed with Sto Corporation, MCI®-2702 is designed for use on vertical or overhead surfaces for repairs from ¼ to 2 inches (6 to 51 mm) or apply it in lifts for deeper applications.

MCI®-2702 is a one-component vertical and overhead repair mortar that is ready to use; just add clean water. Once mixed by drill and paddle, it hangs 2 inches (51 mm) without falling, reducing waste and increasing job-site productivity.

MCI®-2702 provides the necessary concentration of MCI® (Migratory Corrosion Inhibitor) molecules on embedded steel bars. They create a protective monomolecular layer on metals embedded in concrete and inhibit further corrosion of bars.

The polymer in the product provides a creamy consistency that can be finished easily without tearing the surface. Finish it smooth with a trowel or textured with a sponge float or brush.
Use MCI®-2702 for application depths from ¼ to 2 inches (6 mm to 51 mm) or apply it in lifts for deeper applications.

Features	Benefits
Polymer-modified	Increases durability and freeze-thaw resistance; excellent adhesion; improves flexural strength
Low shrinkage	Stable bond line; resists perimeter cracking
Thermally compatible with concrete	Prevents delamination caused by temperature changes
Integral Corrosion Inhibitor	Protects embedded steel against corrosion
High abrasion resistance	Wears longer; stands up to abusive traffic
One component	Factory-controlled polymer-to-cement ratio; ready-to-use; easily mixed with water on the job-site, no chemical jugs to dispose
Contains Migrating Corrosion Inhibitor (MCI)	Seeks out and forms a corrosion inhibiting protective layer on metals; migrates to adjacent areas to protect metals around the repair area; reduces the halo or ring effect surrounding the repair area

SURFACE PREPARATION

Remove loose and deteriorated concrete by mechanical chipping or sandblasting to obtain a fractured aggregate surface. Detail the edge of the patch to a 90° angle to eliminate feather edging. Make sure surfaces are sound, clean, and free of all bond-inhibiting materials including oil, dirt, dust, laitance and standing water.

MIXING

Use MCI®-2702 at a preconditioned temperature of 70 ± 5°F (21 ± 3°C).
Use 6.0 to 6.5 pints (2.83 to 3.08 L) of water per 56-pound (25 kg) bag.

Mixing must be achieved mechanically using a slow-speed, ¾ inch (19 mm) drill and mixing paddle. Pour 6.0 pints (2.83 L) of water into a clean 5 gallon (19 L) mixing bucket. Mix while slowly adding the powder, one-third at a time. If more water is needed, up to one-half pint (.24 L) may be added.

Mix up to 4 minutes, to a uniform, lump-free consistency. Avoid overmixing, which could entrap air. Once mixed, the working time is 25-45 minutes, depending upon material, ambient and surface conditions.

LIMITATIONS

- Apply only when the surface and ambient temperature are 45-50° F (7-10°C) and rising. See Cold Weather Application guidelines, per ACI, for applications in temperatures less than 50° F (10°C). Applications made during temperatures greater than 85°F (29°C) should follow Hot Weather Application guidelines, per ACI.
- The minimum required thickness is 1/4 inch (6 mm).
- Application depths greater than 2 inches (51 mm) must be completed in lifts.
- Do not add more water than specified.
- Do not add additional powder from other units.
- Do not overmix.

CORTEC CORPORATION
Environmentally Safe VpCI™/ MCI® Technologies

APPLICATION

Apply only to sound and clean, properly prepared, frost-free surfaces. Dampen the area to be repaired so that the pores of the concrete are filled with water. Remove any ponding or glistening water on the surface (saturated surface dry/SSD). IMPORTANT: Work a scrub coat of the mixed material into the substrate to ensure intimate contact and establish bond.

Complete the repair while the scrub coat is still wet and trowel to the desired finish. MCI-2702 can be applied to a thickness of 2 inches (51 mm) in one lift. For application depths greater than 2 inches (51 mm) apply MCI®-2702 in successive lifts.

For more lifts, scarify the first lift and allow it to set until hardened sufficiently to accept the next lift, about 30 minutes at 75°F (23°C). Trowel the final lift to the desired finish.

Curing

Direct sun or wind may cause unwanted rapid surface drying. Curing may be accomplished by continuous water fogging for 48 hours or cover with damp burlap or burlene curing blankets. Do not use solvent-based curing compounds. If a coating or sealer will be applied, use water fogging or blanket curing methods and prep finished surface per manufacturer's recommendations.

Clean Up

Clean tools and equipment with water immediately after use. Cured material can only be removed mechanically.

YIELD

0.43 ft^3 per 56 lb bag (0.012 m^3 per 25 kg bag).

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

COVERAGE

20-25 ft^2 per 50 lb bag, applied at ¼ inch thick (2 m^2 per 23 kg bag, at 6 mm thick).

TECHNICAL DATA

Report	Test Method	Criteria	Test Results
Working time (minutes)			15-30
Compressive Strength (psi/Mpa)	ASTM C-109	1 day	3,000+/20.7
		7 days	5,000+/34.5
		28 days	7,000+/48.3
Flexural Strength (psi/Mpa)	ASTM C-293	7 days	1,100+/7.59
		28 days	1,500+/8.97
Modulus of Elasticity in Compression (psi/Mpa)	ASTM C-469	28 days	2.26×10^6/ 1.56×10^4
Splitting Tensile Strength (psi/Mpa)	ASTM C-496	7 days	485/3.35
		28 days	565/3.90
Shrinkage (%)	ASTM C-157	7 days	<.1
		28 days	<.1
Direct Tensile Bond (psi/Mpa)	ASTM D-4541	28 days	500
Length Change	ASTM C-157	28 days	<0.03*

Typical values for material cured at 73°F (23°C) and 50% R.H.
* Wet Cure

PACKAGING AND STORAGE

MCI®-2702 is available in 56 lb bag (25 kg). The shelf life of the product is 12 months in original, unopened, properly stored container. Store in a dry area between 50°F (10°C) and 85°F (29°C). Protect from direct sunlight and extreme heat.

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer

VpCI®-375

PRODUCT DESCRIPTION

VpCI-375 is a unique, water-based acrylic one coat system (primer & topcoat) that successfully provides protection in harsh, outdoor, unsheltered applications. The complex mixture of non-toxic, organic inhibitors offers protection that can compete with most paints and zinc-rich primers.

VpCI-375 provides a fast-drying thixotropic coating that is resistant to sagging or running, forming a tough protective barrier. This dry-to-touch film offers extended protection for outdoor or indoor conditions. It gives optimal outdoor performance without cracking or chipping upon prolonged exposure to sunlight.

FEATURES

- Fast-drying
- Non-flammable
- UV resistant when dried
- Optimal outdoor performance
- Can be used as one coat system (primer & topcoat)
- Provides multimetal protection

METALS PROTECTED

- Carbon steel
- Copper
- Aluminum**
- Stainless steel
- Galvanized steel**

** A wash primer such as VpCI-373 green applied at 0.5-1.0 mils (12.5-25 microns) is recommended before applying the VpCI-375 to these substrates.

CORROSION RESISTANCE DATA*

(on carbon steel 1010 Q-panels)

	Dry Film Thickness Mils (Microns)	Hours to Failure
ASTM B-117 (Salt-spray)	4.0-4.5 (100.0-112.5)	2500 +
ASTM D1748 (Humidity)	4.0 - 4.5 (100-112.5)	2000 +
ASTM D870 (Water Immersion Recovery Resistance)	4.0 (100)	5B Adhesion after 24 hours 312 hours

TYPICAL PROPERTIES*

Appearance	Liquid, various colors
Density	8.5-10.2 lb/gal (1.01-1.22 kg/l)
Non-volatile Content	40-52%
Dry Film Thickness (per coat)	3.0-5.0 mils (75-125 microns)
Theoretical Spread Rate	128-214 ft²/gal (3-5 mils) (3.2-5.3 m²/l) (75-125 microns)
Dry to Touch Time	20 minutes @ 77°F (25°C) at 3 mils (75 microns) WFT
Fully Cured	7 days@77°(25°C) 55% RH
Temperature Stability	45°-90°F (7°-32°C)
VOC (ASTM D-3960)	0.7-0.8 lb/gal (84-96 g/l)
Viscosity	800-4,000 CPS @ 77°F (25°C)***
Gloss (ASTM D532)	50 max
Pencil Hardness (ASTM D3363)	H
Adhesion (ASTM D3359)	5B
Flexibility (ASTM D522)	1/2" 180°bend
Temperature resistance (Fully Cured)	-150°F to 350°F (-78°C to 180°C)

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

APPLICATION

VpCI-375 when applied in 4 mil DFT can be used as a topcoat and primer. VpCI-375 can also be used as a topcoat with Cortec VpCI-374 primer. When solvent-based topcoats are applied over VpCI-375, compatibility must be checked.

Note: Make sure dew point is more than 5°F (2°C) less than air temperature for application.

Power agitate to a uniform consistency using a "squirrel cage" type mixer, hand-held drill mixer, or other equivalent method.

VpCI-375 can be applied by spray, roll, brush, or dip.

Conventional Spray

Manufacturer	GunModel	Tip/Aircap Combination
DeVilbiss	MBC or JGA	704E
Binks	#18 or #62	66PE

Fluid hose should be 3/8" (0.95 cm) I.D. with a maximum length of 50 feet (15.2 m). Pot should always have dual regulation and be kept at same elevation as spray gun.

Airless

Manufacturer	Gun Model	Tip/Aircap Combination
Graco	205-591	Bulldog
Binks	Model 500	Mercury 5C
DeVilbiss	JGN-501	QFA-519

Hose should be 3/8" (0.95 cm) I.D. minimum, but a ¼" (0.64 cm) I.D. whip end section may be used for ease of application. A maximum length of 100 feet (30.5 m) is suggested. Best results will be obtained using a 0.013"-0.017" (0.3-0.4 cm) tip at 1200-1700 psi (83-117 bar).

Note: Nylon or Teflon type packings are available from pump manufacturer and are highly recommended.

Note: Similar equipment may be suitable.

PACKAGING AND STORAGE

VpCI-375 is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) metal drums, liquid totes, and bulk. Keep product from freezing. Product shelf life is 1 year.

FOR INDUSTRIAL USE ONLY
KEEP OUT OF REACH OF CHILDREN
KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION
CONSULT SAFETY DATA SHEET FOR MORE INFORMATION

*All tests performed after a 7 day cure at ambient temperature
*** Viscosity can be set per customer request.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised: 8/26/13. ©Cortec Corporation 2006-2013. Supersedes: 3/27/12. Cortec® is a trademark of Cortec Corporation.

VpCI®-396

PRODUCT DESCRIPTION

VpCI-396 is a high solids aromatic moisture cure urethane. VpCI-396 is a direct to metal primer for multimetal protection. VpCI-396 should be top coated with an aliphatic urethane top coat for best results. In addition to the outstanding barrier protection, VpCI-396 also contains contact corrosion inhibitors for additional protection. VpCI-396 is suitable for immersed structures when applied over VpCI® CorrVerter® for marginally prepared surfaces; such as ballast tanks, storage tanks, or holding tanks containing hydrocarbons to high salinity solutions.

VpCI-396 forms a very hard, but flexible coating that cures in the presence of moisture in the air. For best results the curing conditions required are a relative humidity between 20% and 80% with temperatures above 32°F (0°C) and below 120°F (50°C).

FEATURES

- Single component package
- Can be coated at a relative humidity up to 80%
- Can be applied at low temperatures
- Excellent adhesion
- High solids

METALS PROTECTED

- Aluminum**
- Cast iron
- Galvanized steel**
- Steel

** A wash primer such as VpCI®-373 green applied at 0.5-1.0 mils (12.5-25 microns) is recommended before applying the VpCI-396 to these substrates.

TYPICAL APPLICATIONS

- Bridges
- OEM
- Structural steel
- Storage tanks
- Ballast tanks or ships

TYPICAL PROPERTIES

Appearance	Viscous aluminum liquid
Dry to recoat time	Minimum 4 hr. @ 77°F (25°C), 55% relative humidity
Maximum time to Recoat	2 weeks after initial application (solvent wipe may be required)
Dry to touch time	1 hr. @ 77°F (25°C), 55% relative humidity
Fully Cured	7 days @ 77°F (25°C), 55% RH
Film type	Hard
Flash point	78°F (25°C)
Non-volatile content	63-72% by weight (60-62% by volume)
Shelf life	1 year
Theoretical spread rate	328-481 ft^2/gal @ 2-3 mil DFT (7.9-11.6 m^2/l @ 50-75 microns DFT)
Viscosity	500-1100 cps at 6 rpm
VOC (regulatory)	3.1-3.2 lb/gal (372-384 g/l)
VOC (actual)	3.1-3.2 lb/gal (372-384 g/l)
Density	9.2-9.6 lb/gal (1.10-1.15 kg/l)
Coefficient of Friction	0.20
Adhesion	5B
Film Hardness	4H-7H
Temperature Resistance (Fully Cured)	-150°F to 300°F (-78°C to 150°C)

CORTEC CORPORATION
Environmentally Safe VpCI® MCI® Technologies

SURFACE PREPARATION
NACE #2, ARS High A-3, SSPC SP6 or 10. Surface must be dry prior to application of product (no moisture).

APPLICATION
Product Preparation:
Stir VpCI-396 prior to usage. (Do not use a high shear blade).

Methods for Monitoring Application:
Wet film thickness gauge.

Product Application:
Normal wet film thickness of 3-5 mils (75-125 microns) yields 2-3 mils (50-75 microns) dry film thickness. It is recommended under high humidity conditions (60-80%) that the maximum wet film thickness should be reduced to approximately 2-2.5 mils (50-62 microns), and application of two coats may be necessary.

Do not exceed 3 dry mils (75 microns).

Recommended use of Airless Spray:

Manufacturer	Gun Model	Tip/Aircap Combination
Graco	205-591	Bulldog
Binks	500	Mercury 5C
DeVibiss	JGN-501	QFA-519

Hose should be 3/8" (0.95 cm) I.D. minimum, but a ¼" (0.6 cm) I.D. whip end section may be used for ease of application. A maximum length of 100 feet (30.5 m) is suggested. Best results will be obtained using a 0.013"-0.017" (0.03 cm - 0.04 cm) tip at 1200-1700 psi (83-117 bar).

NOTE: Nylon or Teflon type packings are available from pump manufacturer and are highly recommended.
NOTE: Similar equipment may be suitable.

Product Cleanup:
Low flash point solvent (xylene, toluene, aromatic 100)

TEST DATA [AT 2 MILS (50 MICRONS)] DFT*

Test Method	SAE 1010 Carbon Steel
Salt Spray (ASTM B 117)	900-1000 hours
Humidity (ASTM D 1748)	1000+ hours

*Dry Film Thickness

PACKAGING AND STORAGE
VpCI-396 is available in 5 gallon (19 liter) metal pails. One gallon pails available upon request.

Important: A partially used container must be purged with nitrogen to prevent a reaction in the can if it is not used within one day!

LIMITATIONS
Apply VpCI-396 only at relative humidity of between 20% and 80%. Air temperature should be between 32°F and 100°F (0°C and 38°C).

FOR INDUSTRIAL USE ONLY
KEEP OUT OF REACH OF CHILDREN
KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION
CONSULT SAFETY DATA SHEET FOR MORE INFORMATION

Distributed by:

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

printed on recycled paper 100% post consumer

MCI®-2020 IPA

PRODUCT DESCRIPTION

MCI®-2020 IPA is an isopropanol based surface applied corrosion inhibitor designed to migrate through even the densest concrete structures and seek out the steel reinforcement bars in concrete. MCI®-2020 IPA also protects a multitude of metals including carbon steel, galvanized steel and aluminum. The unique feature of Migrating Corrosion Inhibitors (MCI®) is that if not in direct contact with metals, the inhibitor will migrate a considerable distance through concrete to provide protection. MCI®-2020 IPA will stop further corrosion of reinforcing metals and extend the service life of the structure.

WHERE TO USE

MCI®-2020 IPA is recommended for:

- All reinforced, precast, prestressed, post-tensioned or marine concrete structures
- Steel-reinforced concrete bridges, highways and streets exposed to corrosive environments (carbonation, deicing salts and atmospheric attack)
- Parking decks, ramps and garages
- Preventive maintenance of all reinforced concrete commercial and civil engineered structures
- Concrete piers, dams, offshore platforms, piles, pillars, pipes and utility poles
- Restoration and repair of all reinforced concrete commercial and civil engineered structures
- Plant floors subject to chemical and/or acid attack
- Buildings and foundations of all types
- Cooling towers and portable water tanks

ADVANTAGES

- MCI®-2020 IPA offers engineers, owners, contractors, DOTs and government agencies a time proven corrosion inhibiting technology that will extend the life of all reinforced concrete structures.
- Protects against the harmful effects of corrosion by migrating into even in the densest concrete
- Migrating corrosion inhibitors reduce further corrosion of the most rusted metals
- Easily applied by spray, roller, squeegee or paint brush to any concrete surface, reducing the high cost of labor and equipment
- Does not contain any calcium nitrite
- Water-based and non-flammable for easy handling
- Does not require the removal of sound concrete
- Organic, safe and environmentally friendly
- Enhances the durability of reinforced concrete
- Lab and field tested worldwide
- Allows concrete to breathe and vapor to diffuse, is not a vapor barrier
- Protects both anodic and cathodic areas
- Proven to migrate to adjacent areas to protect surrounding metals
- No cure time is required. Traffic may resume minutes after application, if necessary

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

COVERAGE
150 ft^2/gallon (3.68m^2/liter). Dense substrates may require two coats at the rate of 300 ft^2/gallon (7.36m^2/liter)

PACKAGING
MCI®-2020 IPA is available in 5 gallon (19 liter) pails and 55 gallon (208 liter) drums.

SURFACE PREPARATION
Surface should be dry, sound, clean and free of all dirt, oil, grease efflorescence, sealers, coatings, membranes and asphalt. Cleaning may be done by steam cleaning, water-blasting or sandblasting.

APPLICATION
Apply the solution by spray (conventional airless or hand pressure spray equipment), roller, squeegee or paint brush to any concrete surface. Dense substrates may require two coats with a minimum of 8 hours between coats. When applying a sealer, coating, repair mortar or concrete overlay, the surface should be rinsed with water, pressure washed or blast-cleaned to remove any residue.

LIMITATIONS
The substrate and ambient temperature should be above freezing and below 125°F (50°C). Do not apply if the temperature is expected to fall below freezing within 12 hours. MCI® will not penetrate film-forming sealers, coatings, paints, membranes or asphalt.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

PHYSICAL PROPERTIES
MCI®-2020 IPA

Appearance	Clear to slightly hazy amber liquid
pH	9-9.7 (Neat)
Density	7.7-8.0 lb/gal (0.92-0.95 kg/l)
Storage/Shelf Life	24 months in sealed drums
Storage	Minimum -24°F (-31°C)
	Maximum 212°F (100°C)

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 products 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 THEREWITH. 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.

Distributed by:

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

MCI® Super Remover

PRODUCT DESCRIPTION

MCI Super Remover is a powerful product for removing calcium carbonate and oxides, including hardened concrete residues, encrusted hard water scales, and rust on mild steels.
MCI Super Remover is classified as a mild skin irritant according to OECD Principles of GLP (Good Laboratory Practice). MCI Super Remover is an acid replacement technology that uses low pH organic salt to replace traditional mineral and organic acids.

FEATURES

- Excellent replacement of muriatic acid at removing hardened concrete residues, even aged materials on equipment surface
- Excellent at removing encrusted hard water scales.
- Excellent at removing rust from mild steel
- Non-fuming
- Classified as a mild skin irritant according to the OECD Principles of GLP
- Phosphate free and containing no VOCs
- Low contributor to BOD/COD in effluents
- Non-corrosive to mild steel
- Approved by the US EPA as a non-food inert ingredient in biocide applications
- Biodegradable

TYPICAL USES

- Drum Mixers
- Ready-mix trucks
- Batching Plants
- Construction equipments
- Water treatment facilities during periodical cleanings
- De-scalers/de-limers
- Rust Remover for mild steel
- Excellent replacement for Phosphoric and Nitric Acid

APPLICATIONS

- For removing hardened concrete residues: Use MCI Super Remover undiluted. Keep the concrete residues wetted with MCI Super Remover solution for 30 minutes to 3 hours, depending on the thickness and age of the residue. Repeat applications may be necessary for thick patches of concrete; scrape to improve penetration. Do not leave Super Remover on bare metal for extended periods. For tough residues on small tools, the best method is to immerse the object in MCI Super Remover. Scrape to improve penetration. Afterwards, lightly scrape off, or pressure wash the softened residues and rinse thoroughly. Rinsing with a neutralizing cleaner such at VpCI®-416 or VpCI®-414 provides further protection.
- For removing scale: Apply MCI Super Remover undiluted to the facilities needing cleaning for 30 minutes to 1 hour. Collect the used MCI Super Remover solution, then rinse thoroughly.
- For removing rust from mild steel: Use as is, or dilute MCI Super Remover up to 1:3 in water. Apply to corroded area and keep contact for 5 -15 minutes. Use light abrasion to remove loose rust and to speed up the penetraton. Rinse and rub dry. If air drying, rinse with neutralizing cleaner such as VpCI-416 or VpCI-414 to provide further protection.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

CONSIDERATIONS

MCI Super Remover can be used multiple times. Remove any sediments from the solution and check pH of the solution (pH=<2) before reuse.

- MCI Super Remover does not damage painted surface of moisure-cured aliphatic urethane paints, common uncoated glass surfaces, fiberglass, and rubber. Test is recommended to confirm suitability to your treatment surfaces.
- Spraying of MCI Super Remover may produce discoloration on certain metals (brass and some stainless steel appear to be most affected). Test compatability in an inconspicuous area before use. Immersion produces best results for most materials.
- Do not immerse aluminum in MCI Super Remover
- Use in a well ventilated area
- Protect eyes, skin, and clothing from spray mist by wearing goggles and protective coverings

TYPICAL PROPERTIES

Appearance	Clear Amber liquid
WPG	9.1 - 9.3 (lbs/gallon)
pH	0.4-0.8 (neat)

PACKAGING AND STORAGE

- MCI Super Remover is available in bulk, 55 gallon polyethylene drums and 5 gallon pails
- Product can be stored in high-density polyethylene, polypropylene, or fiberglass containers.
- DOT classification: Non-regulated (U.S. ground shipments) Regulated for and marine transportation

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer
Revised 7/19/12 .

MCI® Window Protector

PRODUCT DESCRIPTION

MCI Window Protector is designed to repel rain or snow and reduce ice and grime build up on the glass surfaces of buildings and automobiles. This product greatly reduces the need to clean the outside of windows, reducing labor costs. Visibility improves when applied on the vehicle windshield.

APPLICATION DIRECTIONS

- Clean and dry exterior glass area. For best results use window cleaning solution
- Apply product to a dry cloth and wipe glass with firm, circular, overlapping strokes
- Allow slight haze to appear
- Repeat application
- Buff surface with dry cloth until haze is removed

Important Note: Do not apply to interior windows.

ADVANTAGES

- Repels rain and snow from windows
- Reduces ice and grime buildup on windows

COVERAGE RATE

Product is used at full strength
Approximate coverage rate: 1440 ft^2/gal (36m^2/L)

TYPICAL USES

- Window exteriors on industrial buildings
- Automotive glass and windshields
- Fog lights

FEATURES

- Invisible and not reflective
- Causes rain, sleet, and snow to bead-up and roll off glass surfaces
- Reduces the adhesion and build up of scale, mud, dust, insects, and road grime

TYPICAL PROPERTIES

Appearance	Slighly yellow to clear liquid
WPG at 25°C	6.6-6.8 lbs/gal (0.79-0.81 kg/l)

PACKAGING AND STORAGE

MCI Window Protector should be kept away from heat and open flame. When stored in original, airtight containers at 5°C (40°F) to 40°C(105°F), MCI Window Protector has a shelf life of 3 years from the date of shipment.

MCI Window Protector is available in 5 gallon (19 liter) pails and 55 gallon (208 liter) drums; also available in a16 oz. trigger spray bottle.

MCI® MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 04/22/13. Cortec Corporation 2012 - 2013. Supersedes: 03/15/13.

ISO accreditation applies to Cortec's processes only.

8.3
Steel Bridges

CorrVerter® Rust Primer

PRODUCT DESCRIPTION

CorrVerter is a water-based primer recommended for application to rusty or poorly prepared steel surfaces where further corrosion protection is required and good surface preparation is difficult to achieve. CorrVerter is formulated to penetrate rust, eliminate rust, penetrate to the bare metal, and stop further rusting.

CorrVerter contains a novel chemical chelating agent that modifies the surface rust into a hydrophobic passive layer. CorrVerter combines the above mentioned chelating agent with a high solids waterborne latex with extremely low water vapor permeability. The combination of the active chelating agent with a film-forming latex, thickeners and dispersant offers a unique formulation for a primer with excellent protection against re-rusting.

CorrVerter does not contain tannic or phosphoric acids, provides long-term corrosion protection for poorly prepared substrates, and can be topcoated with solvent-based and water-based paints with no bleeding. For outdoor applications VpCI®-386 or VpCI-387 can be utilized. For indoor applications, VpCI-396 may also be used.

The combination of CorrVerter and VpCI-396 provides the best immersion coating for submersion in water, salt water, hydro carbons, and high salinity water.

FEATURES

- CorrVerter converts rust quickly and can be applied under varying weather conditions
- Provides 1000+ hours of corrosion protection with 3-mil (75 microns) application under salt spray conditions (ASTM B 117), on pre-rusted steel parts
- Can be topcoated with water- and solvent-based topcoats vs. tannic or phosphoric acid-based coatings, which can only be topcoated with solvent-based topcoats
- Provides excellent protection against re-rusting (better than tannic or phosphoric acid-based converters)
- Water-based
- Very low VOC
- Environmentally friendly, non-toxic
- Non-flammable, non-combustible
- Works in HCl, H_2S, SO_2, & CO_2 vapor environments
- Available in 2 colors, black and green

PROPERTIES

Appearance	Viscous liquid
Total Solids, by weight	52-58%
Total Solids, by volume	40-42%
Density	11.4-12.0 lb/gal (1.36-1.44 kg/l)
Salt Spray (ASTM B 117)	1000 hours at 3-5 wet mils (75-125 microns DFT)
VOC (regulatory)	0.3-0.4 lb/gal (35.9-47.9 g/l)
VOC (actual)	0.1-0.2 lb/gal (11.9-24.0 g/l)
Coverage	167-278 ft²/gal (4.2-5.6 m²/l)

TYPICAL APPLICATION

CorrVerter is recommended for use on all ferrous metal surfaces as a rust converter/paint primer. The product can be used in situations where proper cleaning or sandblasting is difficult.

- Industrial maintenance
- General metal
- Marine
- Holding tanks

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

APPLICATION

It is recommended that any loose rust be removed with a wire brush and the rusty steel surface washed with high-pressure water to remove excess salt contamination before applying the product. Brush, roll, or spray CorrVerter with no surface show-through at 3-5 mils (75-125 microns) wet film thickness. Brush application is preferred to ensure penetration into the rust. The coating can be applied to dry or damp surfaces. The converter can be used as is or may be diluted up to 10% with water. For badly corroded surfaces, a second coat of CorrVerter should be applied within 20-30 minutes to ensure maximum protection. Allow to air dry 12-24 hours before applying topcoat or putting the coated components into the environment.

LIMITATIONS

- The latex resin in the primer is not UV stable, and changes color in outside conditions.
- For proper application, the product should always be mixed thoroughly before use.
- The converter may be diluted up to 10% with water, but should be thoroughly mixed and applied immediately after preparation.
- On certain types of rust, various degrees of darkening may be visible, and may even be incomplete under certain drying conditions. The degree of darkening does not affect the coating; the primer will continue to convert rust. Upon drying, the formulation will exhibit excellent performance.

PACKAGING AND STORAGE

CorrVerter is available in 5 gallon (19 liter) plastic containers. Keep product from freezing. The shelf life of the coating is one year.

FOR INDUSTRIAL USE ONLY
KEEP OUT OF REACH OF CHILDREN
KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION
CONSULT SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised: 1/7/14, ©Cortec Corporation 2001-2014. All rights reserved. Supersedes:1/8/13.

GalvaCorr®, Patented

Galvanic coating for concrete

Based on technology developed at the NASA Kennedy Space Center*

PRODUCT DESCRIPTION

GalvaCorr is a three component, moisture curing, metal rich, urethane coating. GalvaCorr is a galvanic coating for concrete that uses sacrificial metals to provide cathodic protection to embedded steel rebar. GalvaCorr is electrically connected to the rebar and galvanically stops the corrosion. This eliminates the need for expensive external power sources for corrosion protection. GalvaCorr is formulated with additives that promote the galvanic action.

GalvaCorr is superior to other galvanic protection coatings in cost and ease of application. It can be spray or brush applied. Application of GalvaCorr does not require expensive surface preparation. Power washing will be sufficient in most cases.

The use of Cortec's MCI®-2020 surface applied corrosion inhibitor is an excellent complement to this system. If MCI-2020 is to be used, it must be applied prior to GalvaCorr. Also, MCI-2020 must have 8-24 hours to penetrate concrete followed by a water rinse to remove any residue. Wait an additional 24 hours, (concrete should be dry to touch), before GalvaCorr is applied.

APPLICATION CONSIDERATIONS

- GalvaCorr is not a traffic bearing coating.

*NASA Advanced Materials Symposium, May 16, 2002, Cleveland, Ohio

FEATURES

- Low VOC
- Does not contain zinc phosphate
- Can be applied at low temperatures
- Excellent adhesion
- High solids
- Easy to apply
- Cost effective
- Prompt protection

WHERE TO USE

GalvaCorr is excellent for underside application to structures such as:

- Bridges, buildings, and foundations of all types
- Parking decks, ramps, and garages
- Commercial and civil engineered structures
- Concrete piers, offshore platforms, piles, pillars, pipes, and utility poles above water line

SURFACE PREPARATION

The substrate must be clean, dry to touch, and sound. New concrete should be cured for at least 28 days. Remove dust, laitance, grease, curing compounds, efflorescence, sealers, waxes, foreign particles, disintegrated or soft base materials, and any previous applied non-conductive coatings. Cleaning may be done by steam cleaning, water-blasting, or sand blasting.

APPLICATION

Reinforcement should be tested for continuity. Unconnected rebars may be connected by welding wires to adjacent rebars.

For best results apply the coating solution between 40%-85% relative humidity and temperatures over 32°F (0°C). Curing time is 12 hours. In conditions with lower relative humidity GalvaCorr should be lightly sprayed with water within five hours after application to assist curing. If necessary, GalvaCorr Thinner may be used if product needs thinning. Please consult a Cortec Representative for full application instructions, including how to connect the coating to the embedded reinforcement.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

PACKAGING AND STORAGE

GalvaCorr is available in 50 lbs/5 gal (22.7 kg/19L) kits. One kit will mix in a 5 gallon pail. Store at temperature below 95°F (35°C).

TYPICAL PROPERTIES

	Part A	Part B	Part C	GalvaCorr®
Appearance	Amber viscous liquid	Gray powder	Tan paste	Gray viscous liquid
Shelf Life	6 months	12 months	12 months	NA
Pot Life (varies with atmospheric conditions)	NA	NA	NA	2-4 hours
Mass Density	8 lbs/gal (0.96 kg/L)	10.8 lbs/gal (1.3 kg/L)	11.8 lbs/gal (1.4 kg/L)	12.4 lbs/gal (1.5 kg/L)
Solids	40%	100%	62%	81%
VOC	4.78 lbs/gal (0.57 kg/L)	NA	4.0 lbs/gal (0.48 kg/L)	1.7 lbs/gal (0.20 kg/L)
Minimum DFT	NA	NA	NA	24 mils (600µM)
Dry to Touch	NA	NA	NA	40 minutes at 68°F (20°C)
Dry to Recoat	NA	NA	NA	12 Hours
Cure Time	NA	NA	NA	12 Hours
Maximum Time to Recoat	NA	NA	NA	Unlimited
Flash Point	57°F (14°C)	799°F (426°C)	329°F (165°C)	57°F (14°C)
Theoretical Spread Rate	NA	NA	NA	60 ft^2/gal @ 24 mils (1.6 m^2/L @ 600µM)

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

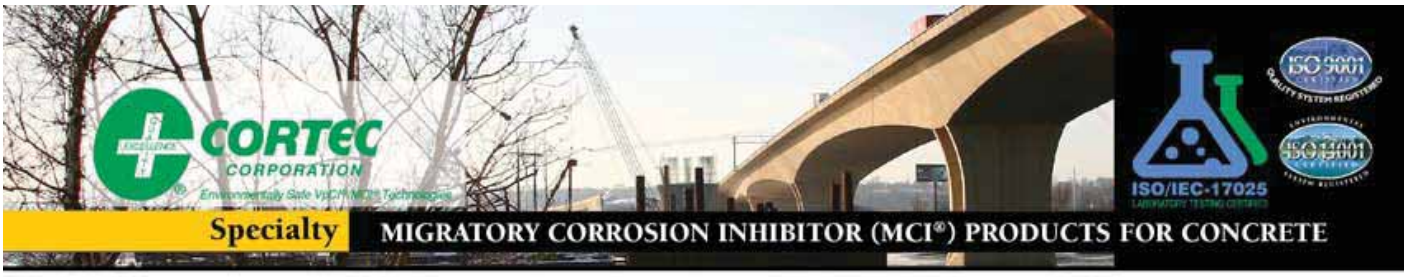
THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. IN NO CASE SHALL CORTEC CORPORATION BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer



MCI® Coating for Rebar

PRODUCT DESCRIPTION

MCI Coating for Rebar provides excellent protection in outside storage as well as offering superior corrosion resistance for embedded rebars. This product is water based and environmentally friendly.

The recommended dry film thickness range is 1-2 mils (25-50 microns). As a soft film, MCI Coating for Rebar is an excellent choice for long-term indoor protection (up to 5 years*) and short to medium-term (6-24 months*) unsheltered outdoor protection. The product cures to a soft film and eventually hardens. MCI Coating for Rebar has been tested for adhesion to concrete in accordance with ASTM A 775/A 775 M and showed positive results, confirming that MCI Coating for Rebar does not have to be removed prior to embedding in concrete (see Table 2).

*Depends on conditions and/or film thickness

FEATURES

- Excellent outdoor protection
- Protects steel, aluminum, cast iron, and tin
- Safe and easy to use
- Environmentally friendly
- Does not affect concrete adhesion to rebar
- Dilutable with water
- Can be removed by using an alkaline cleaner such as MCI-2060 if needed
- Works in SO_2 and H_2S environments

TYPICAL APPLICATIONS

- Protection of rebar partially embedded in concrete
- Jobsite/warehouse storage
- Processing protection
- Overseas shipping
- Maintenance repairs

PROPERTIES

Appearance	Off-white to beige viscous liquid
Dry to Recoat Time	30-90 minutes@72°F(22°C), 55% RH
Dry to Tacky Time	10-60 minutes@72°F(22°C), 55% RH
Dry to Cure Time	1-3 hours@72°F(22°C), 55% RH
Film Type	Soft, tacky
Non-volatile Content	27-33%
Shelf Life	12 months at 75°F (24°C) in a sealed drum
Theoretical Coverage	280-561 ft^2/gal at 1-2 mil DFT (7-14 m^2/l at 25-50 microns)
VOC (regulatory)	0.29 lb/gal (34.3 g/l)
VOC (actual)	0.22 lb/gal (25.84 g/l)
Density	8-8.3 lb/gal (0.95-1.01 kg/l)
pH	9-10 (neat)

Table 1
Corrosion Protection Properties

Test Method	DFT*	SAE 1010 Carbon Steel
ASTM D1748 Humidity	1-mil (25 microns)	1000+ hr.
ASTM G 85-94 Prohesion	1-mil (25 microns)	600 hr.
ASTM B117 Salt Spray	1-mil (25 microns)	200 hr.
ASTM B117 Salt Spray	2-mils (50 microns)	600 hr.

*Dry Film Thickness. Coverage at 1 mil is 280 ft^2/gal
Coverage at 2 mil is 561 ft^2/gal

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

Table 2
Adhesion to concrete results
(ASTM A 775/A 775M)

Test No	Pounds of Force*	
	Coated with MCI® Coating for Rebar	Uncoated
1a	2,660 @ free-end	----
1b	2,480 @ loaded-end	----
1c	2,660 @ free-end	----
2a	----	2,600 @ loaded-end
2b	----	2,670 @ loaded-end
2c	----	3,040 @ loaded-end

*Data indicates the smaller of the pounds of force required to move the embedded rebar either 0.002" as measured at the free-end or 0.010" at the loaded-end.

PRODUCT CLEANUP
Use soapy water to clean up tools and overspray.

APPLICATION CONSIDERATIONS
MCI Coating for Rebar should be completely dry before placing the part into storage.

PACKAGING AND STORAGE
MCI Coating for Rebar is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) metal drums, liquid totes and bulk. Do not allow product to freeze.

APPLICATION
Surface must be equivalent to ARS Low A-3 and higher or SSPCs 1, 2, 3, 5, 6, and 10 depending on the metal.

Mix MCI Coating for Rebar well prior to use. MCI Coating for Rebar can be used "as is" or diluted with water up to 50%, as long as a 1.0-2.0 mils (25-50 microns) dry film thickness is reached on surface to be protected. It can be applied by spray, brush, roll, or dip.

Airless Spray:

Pressure	2000 psi (140 bar)
Filter	60 mesh
Tip	0.015" (0.038 cm)
Dilution	(0-50%)

Conventional:

Equipment	Binks 18 gun or equivalent
Automatization pressure	40 psi (3 bar)
Fluid pressure	20 psi (1 bar)
Cap/Tip	66/S
Dilution	(10-50%)

FOR INDUSTRIAL USE ONLY
KEEP OUT OF REACH OF CHILDREN
KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION
CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI® MCI® Technologies
4119 White Bear Parkway, St. Paul, MN 55110 USA
Phone (651) 429-1100, Fax (651) 429-1122
Toll Free (800) 4-CORTEC, E-mail info@cortecvci.com
Internet http://www.cortecvci.com

MCI® Coating for Rebar NT

PRODUCT DESCRIPTION

MCI Coating for Rebar NT provides excellent protection in outside storage as well as offering excellent corrosion resistance for embedded reinforcement. This product is water based and environmentally friendly.

The recommended film thickness range is 1-3 mils (25-75 microns) dry film thickness. As a soft non-tacky film, MCI Coating for Rebar NT is an excellent choice for long-term indoor protection (up to 5 years*) and short to medium-term (6-24 months*) unsheltered outdoor protection. The product cures to a soft non-tacky film and eventually hardens. MCI Coating for Rebar NT has been tested for reinforcing steel bond strength in accordance with ASTM A944-99. The results of this test were exceptionally good confirming that MCI Coating for Rebar NT does not have to be removed prior to embedding in concrete (see Table 2).

*Depends on conditions and/or film thickness

FEATURES

- Excellent outdoor protection
- Multimetal protection
- Safe and easy to use
- Environmentally friendly
- Does not affect concrete adhesion to rebar

TYPICAL APPLICATIONS

- Temporary storage of reinforcement and other metal components used in concrete construction
- Processing protection
- Overseas shipping
- Maintenance repairs

PROPERTIES

Appearance	Milky off-white liquid
Non-volatile Content	34-45wt%
Dry to Touch Time	30-60 min at 75°F (24°C), 50% R.H.
Viscosity	1000-6000cps (6 rpm/#3)
pH	8.9-9.5 (neat)
Density	8.1-8.5 lb/gal (1.00-1.01 kg/l)
Theoretical Spread Rate (at 1-3 mil)	187-561 sq ft/gal (4.6-14 m^2/l)
VOC (Regulatory)	1.6-1.7 lbs/gal (191.7-203.7 g/l)
VOC (Actual)	0.7-0.8 lbs/gal (83.9-95.9 g/l)
Dry Film Thickness	1.0-3.0 mils (25-75 microns)
Wet Film Thickness	2.5-7.5 mils (62.5-187.5 microns)

Table 1
Corrosion Protection Properties

Test Method	Thickness of Coating (mils/microns, DFT)	Time of Protection (hours)
Salt Spray (ASTM B-117)	1.0/25	250
	2.0/50	600
Humidity (ASTM D-1748)	1/25	1400
	2/50	1500 +

Table 2
Bond Strength of Steel Reinforcing Bars to Concrete (ASTM A944-99)

Applied Load, in pounds (kg)	Loaded End Elongation, in inches (mm)	
	Control*	MCI Coating for Rebar NT*
2,800 (1,270)	0.053 (1.35)	0.050 (1.27)
7,300 (3,311)	0.090 (2.29)	0.091 (2.31)
10,400 (4,717)	0.220 (5.59)	0.134 (3.40)
15,000 (6,804)	0.293 (7.44)	0.171 (4.34)
20,900 (9,480)	0.319 (8.10)	0.214 (5.44)

*Mean average of three trials, according to AET test report #05-01412.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

SURFACE PREP
Metal should be prepared to SSPC-SP2 with all contaminants of oil, dirt, rust, and grease removed prior to application.

APPLICATION
Mix MCI Coating for Rebar NT prior to use. It can be applied by spray, brush, roll, or dip.

AIRLESS SPRAY EQUIPMENT:

Manufacturer	Gun Model	Tip/Aircap Combination
DeVilbliss	JGN-501	QFA-519
Binks	Model 500	Mercury 5C
Graco	205-591	Bulldog

Hose should be 3/8" (0.95 cm) I.D. minimum, but a ¼" (0.64 cm) I.D. whip end section may be used for ease of application. A maximum length of 100 feet (30.5 m) is suggested. Best results will be obtained using a 0.013"-0.017" (0.3-0.4 mm) tip at 1200-1700 psi (83-117 bar).

Note: Nylon or Teflon type packings are available from pump manufacturer and are highly recommended.
Note: Similar equipment may be suitable.

BRUSH: Nylon/polyester or nylon
ROLLER: Polyester knitted

Product Cleanup:
Use water to clean up tools and overspray.

FOR INDUSTRIAL USE ONLY
KEEP OUT OF REACH OF CHILDREN
KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION
CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

APPLICATION CONSIDERATIONS
Dew point must be more that 5°F (2°C) less than air temperature during application. The ambient air, coating, and metal substrate temperature should be above 55°F (12.8°C) and below 130°F (55°C) when applied.

MCI Coating for Rebar NT should be completely dry before placing the part into storage.

PACKAGING AND STORAGE
MCI Coating for Rebar NT is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) metal drums, liquid totes, and bulk. Do not allow product to freeze. Shelf life is up to 12 months.

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies
4119 White Bear Parkway, St. Paul, MN 55110 USA
Phone (651) 429-1100, Fax (651) 429-1122
Toll Free (800) 4-CORTEC, E-mail info@cortecvci.com
Internet http://www.cortecvci.com

printed on recycled paper 100% post consumer
Revised 7/12/11. Cortec Corporation 2004-2011.

MCI® Construction Film

DESCRIPTION

MCI Construction Film is a blue colored polyethylene film designed for use in the construction industry. Unlike conventional plastic films used for interleaving, vapor barriers, etc., MCI Film contains technology to inhibit corrosion of both ferrous and non-ferrous metals. In areas where conventional films are used, metal parts that come in contact with the film are susceptible to corrosion. The technology incorporated into MCI Film inhibits corrosion on metal parts and structures it is used with.

Not only does MCI Construction Film inhibit corrosion on metallic surfaces that it is in contact with, it also protects other metal parts via vapor phase inhibitors. These inhibitors migrate through the air to reach and protect metal surfaces that are not in direct contact with MCI Construction Film. When MCI Construction Film is used between concrete and metal studs it not only stops the corrosion that can occur at the contact points, it also protects the rest of the stud, adding to the life of the structure.

MCI Construction Film is an excellent replacement for conventional polyethelene sheeting used in the construction industry. It does not contain free amines, phosphates, or halogens. MCI Construction Film is also non-toxic and 100% recyclable.

ADVANTAGES

- Provides multimetal protection
- Void spaces and recessed areas are protected
- Economical
- Provides UV protection
- High puncture and tear resistance
- Good moisture barrier
- Recyclable

METALS PROTECTED

- Carbon steel
- Stainless steel
- Galvanized steel
- Aluminum and alloys
- Copper and alloys
- Zinc

TYPICAL MECHANICAL PROPERTIES

Property	Test Method	Units	Value*
Thickness	ASTM D6988	mil	4.00
Breaking Factor	ASTM D882-02	lbs/in	18/19
Tensile Strength at Break	ASTM D882-02	psi	44423/4357
Elongation at Break	ASTM D882-02	%	778/835
Yield Strength	ASTM D882-02	psi	1334/1610
Tear Strength	ASTM D19222-06a	mN	11160/15413
Puncture Resistance	MIL-STD-3010B	lbf	6.02
Dart Drop Impact Resistance	ASTM D1709-04, Test Mehod A	grams	791

*Machine direction/cross direction

PACKAGING AND STORAGE

MCI Construction Film is available in an 4 mil gauge ranging in widths from 3" to 32' (7.6 cm-9.75m). Contact Cortec® for minimum quantities and specific sizes . Stock size is 20'x100' (6.1m-30.5m) Shelf life is 2 years.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer

MCI® CorShield®

PRODUCT DESCRIPTION

MCI CorShield provides excellent protection in outside storage as well as offering excellent corrosion resistance for embedded reinforcement. This product is water based and environmentally friendly.

The recommended film thickness range is 1-2 mils (25-50 microns) dry film thickness. As a soft non-tacky film, MCI CorShield is an excellent choice for long-term indoor protection (up to 5 years*) and short to medium-term (6-24 months*) unsheltered outdoor protection. The product cures to a soft non-tacky film and eventually hardens. MCI CorShield has been tested for reinforcing steel bond strength in accordance with ASTM A944-99. The results of this test were exceptionally good confirming that MCI CorShield does not have to be removed prior to embedding in concrete (see Table 2).

*Depends on conditions

FEATURES

- Excellent outdoor protection
- Multimetal protection
- Safe and easy to use
- Environmentally friendly
- Does not affect concrete adhesion to rebar

TYPICAL APPLICATIONS

- Temporary storage of reinforcement and other metal components used in concrete construction
- Processing protection
- Overseas shipping
- Maintenance repairs

PROPERTIES

Appearance	Light beige to tan liquid
Non-volatile Content	34-45wt%
Dry to Touch Time	30-60 min at 75°F (24°C), 50% R.H.
Viscosity	1000-5000cps (6 rpm/#3)
pH	8.9-9.5 (neat)
Density	8.1-8.5 lb/gal (1.00-1.01 kg/l)
Theoretical Spread Rate (at 1-3 mil)	187-561 sq ft/gal (4.6*14 m^2/l)
VOC (Regulatory)	1.6-1.7 lbs/gal (191.7-203.7 g/l)
VOC (Actual)	0.7-0.8 lbs/gal (83.9-95.9 g/l)
Dry Film Thickness	1.0-3.0 mils (25-50 microns)
Wet Film Thickness	2.5-4.5 mils (62.5-187.5 microns)

Table 1
Corrosion Protection Properties

Test Method	Thickness of Coating (mils/microns, DFT)	Time of Protection (hours)
Salt Spray (ASTM B-117)	1.0/25	250
	2.0/50	600
Humidity (ASTM D-1748)	1/25	1400
	2/50	1500 +

Table 2
Bond Strength of Steel Reinforcing Bars to Concrete (ASTM A944-99)

Applied Load, in pounds (kg)	Loaded End Elongation, in inches (mm)	
	Control*	MCI CorShield*
2,800 (1,270)	0.053 (1.35)	0.050 (1.27)
7,300 (3,311)	0.090 (2.29)	0.091 (2.31)
10,400 (4,717)	0.220 (5.59)	0.134 (3.40)
15,000 (6,804)	0.293 (7.44)	0.171 (4.34)
20,900 (9,480)	0.319 (8.10)	0.214 (5.44)

*Mean average of three trials, according to AET test report #05-01412.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

SURFACE PREP
Prepare metal surface to SSPC-SP2 with all contaminants of oil, dirt, rust, and grease removed prior to application.

APPLICATION
Mix MCI CorShield prior to use. It can be applied by spray, brush, roll, or dip.

AIRLESS SPRAY EQUIPMENT:

Manufacturer	Gun Model	Tip/Aircap Combination
DeVilbliss	JGN-501	QFA-519
Binks	Model 500	Mercury 5C
Graco	205-591	Bulldog

Hose should be 3/8" (0.95 cm) I.D. minimum, but a ¼" (0.64 cm) I.D. whip end section may be used for ease of application. A maximum length of 100 feet (30.5 m) is suggested. Best results will be obtained using a 0.013"-0.017" (0.3-0.4 mm) tip at 1200-1700 psi (83-117 bar).

Note: Nylon or Teflon type packings are available from pump manufacturer and are highly recommended.
Note: Similar equipment may be suitable.

BRUSH: Nylon/polyester or nylon
ROLLER: Polyester knitted

Product Cleanup:
Use water to clean up tools and overspray.

FOR INDUSTRIAL USE ONLY
KEEP OUT OF REACH OF CHILDREN
KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION
CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

APPLICATION CONSIDERATIONS
Dew point must be more that 5°F (2°C) less than air temperature during application. The ambient air, coating, and metal substrate temperature should be above 55°F (12.8°C) and below 130°F (55°C) when applied.

MCI CorShield should be completely dry before placing the part into storage.

PACKAGING AND STORAGE
MCI CorShield is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) metal drums, liquid totes, and bulk. Do not allow product to freeze. Shelf life is up to 12 months.

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies
4119 White Bear Parkway, St. Paul, MN 55110 USA
Phone (651) 429-1100, Fax (651) 429-1122
Toll Free (800) 4-CORTEC, E-mail info@cortecvci.com
Internet http://www.cortecVCI.com

printed on recycled paper 100% post consumer
Revised 6/25/11. Cortec Corporation 2009-2011. Supersedes: none.

MCI® Creteskin®

Patent Pending

Before Cleaning

After Cleaning

PRODUCT DESCRIPTION

MCI Creteskin is an industrial strength release agent containing Cortec's Migratory Corrosion Inhibitors (MCI). MCI Creteskin is designed for protecting equipment, vehicles, and forms in the construction industry. MCI Creteskin prevents adhesion of cementitious materials, salts, and other abrasives on painted and unpainted metal surfaces. It also provides corrosion protection to the underlying substrate, enabling continued use and a longer lifespan.

FEATURES

- Contains Migratory Corrosion Inhibitors
- Allows cleaning with high pressure water instead of abrasive blasting
- No acid needed in cleaning
- Reduce cleaning to once per week
- Reduce water consumption
- Protects painted and unpainted carbon steel and aluminum
- Chemically resistant to caustic soda and HCl
- Can be used as a sacrificial anti-graffiti coating

TYPICAL APPLICATIONS

- Ready Mix and salt/sand truck chassis'
- Drum mixers
- Batching Plants
- Construction equipment
- Concrete forms and molds
- Scissors lift

TYPICAL PROPERTIES

Appearance	Off white to tan opaque liquid
pH	9.0-9.5 (neat)
Density	8.0-8.5 lb/gal (0.95-1.02 kg/l)
NVC (weight)	30-34%
Coverage Rate	320-640 ft²/gal @ 0.5-1 mil dry film thickness (8-16 m²/L @12.5-25 microns dry film thickness)
Dry to touch time	10 minutes
Cure time	24 hours @70°F (21°C), 50% RH

Test Name	Result
5% Caustic soda spot test	24 hours, no effect
20% HCl spot test	30 hours, no effect
Salt spray resistance, ASTM B-117	168 hours
Humidity resistance, ASTM D-1748	500 hours

(see Cortec report #07-339bis)

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

APPLICATION

(See product specifications for complete application guide)

MCI Creteskin must be thoroughly stirred prior to use. All sensitive parts should be protected from spray.

MCI Creteskin is ideally applied onto a cleaned and dry surface, or to new equipment prior to being used. (Note: New paint must be allowed sufficient time to cure before application of MCI Creteskin and the substrate must be free of moisture and other contaminates.)

The substrate to be coated should be above 55°F (13°C) at times of low humidity (between 10-50% RH). At times of high humidity, (between 50-80% RH), surface temperature should be above 68°F (20°C). Do not attempt to apply in very damp or cold conditions.

Gently mist with commercial spray gun or brush up to three thin (tack) coats totaling 2.5-5 mil (62.5-125 microns) wet film thickness. Allow each coat to dry to the touch which generally takes less than 10 minutes. Applying too much coating will cause it to run and pool, with no added benefit.

MCI Creteskin should be allowed to cure prior to use. The coating will become dry to the touch fairly quickly, but sufficient curing time is necessary for proper performance.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

(To confirm cure, a splash test should be performed.) When cured, MCI Creteskin will have a slight waxy/satin finish. A light buff can be done if required for aesthetic purposes.

Once cured, MCI Creteskin will stand up to high pressure and/or hot water washes typically used when cleaning concrete trucks and other equipment. In some instances maintenance of the coating may be required as some surfaces may wear during normal operation. Recoating or "touching up" an area with MCI Creteskin can be performed by using a brush or hand-held spray bottle. Touch-ups should be done within temperature and humidity guidelines.

EQUIPMENT CLEAN-UP

Prior to curing, overspray of MCI Creteskin can be removed using high pressure water. The spray gun can be cleaned using an alkaline cleaner, such as undiluted MCI-2060.

REMOVAL OF CURED COATING

A strong alkaline cleaner, such as MCI-2060 can be used with scrubbing to remove cured MCI Creteskin.

REMOVAL OF RESIDUAL CONCRETE

Use a high pressure water (2000 psi) washer at 100-160°F (38-71°C).

PACKAGING AND STORAGE

MCI Creteskin is packaged in 5 gallon (19 liter) pails and 55 gallon (208 liter) drums. MCI Creteskin has a shelf life of up to two years in a sealed container. DO NOT ALLOW PRODUCT TO FREEZE.

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer
Revised 9/23/09 . Cortec Corporation 2009-2010. All rights reserved. Supersedes: 4/29/09.

MCI® Peel-off Coating

PRODUCT DESCRIPTION

MCI Peel-off Coating is a corrosion inhibiting, modified water-based acrylic peelable coating. This product provides mechanical protection against nicks, abrasion, scratches, and over-spray to the surface that is covers. MCI Peel-off Coating can be used to protect non-porous walls, ceilings, floors, windows, and light fixtures: one coating can do it all. In addition, MCI Peel-off Coating provides temporary protection to the metals against atmospheric, salt, and chemical induced corrosion. MCI Peel-off coating represents the ultimate in non-solvent peelable coatings. It is well stabilized against brittleness, and it will not be softened or penetrated by most solvent-based paints. MCI Peel-off coating has extremely low VOC and meets the most strict VOC requirements. The coating is stripped or peeled away prior to equipment use and will not leave residue.

FEATURES

- Water-based, VOC compliant
- Environmentally safe, non-flammable
- Can be disposed as a solid waste
- Reduces labor cost by reducing the application time
- Easily removed - peels off in sheets
- Does not leave any residue after removal
- Easy application - excellent sag resistance
- Contains corrosion inhibitors to prevent corrosion on unpainted metal surfaces

LIMITATIONS

- If applied over a primer, the primer should be cured and adhesion to the primer should be tested
- The film can be peeled from the surface when it is thoroughly dried
- The surface that is being coated needs to maintain a minimum temperature of 55°F (12.8°C) and maximum temperature of 150°F (65.5°C)
- It is not recommended for application to wood or similar fibrous substrates.

TYPICAL APPLICATION

MCI Peel-off coating intended as a temporary removable coating. This coating can be applied by spray, roll, brush, or dip. It provides a clear film which allows for inspection of the surface.

The film can be peeled from the surface when it is thoroughly dried, leaving a clean, ready-to-use substrate.

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

Spray Equipment
The following equipment is suggested for application to achieve quality results:

Conventional Spray Equipment:

Manufacturer	Gun Model Combination	Tip/ Aircap
DeVilbliss	MBC or JGA	704E
Binks	#18 or #62	66PE

Fluid hose should be 3/8" (0.95 cm) I.D. with a maximum length of 50 feet (15.2 m). Pot should always have dual regulation and be kept at the same elevation as spray gun. A typical inlet pressure of 30 psi and pot pressure of 10-12 psi are used, these numbers will vary slightly depending on the set-up.

Airless Spray Equipment:

Manufacturer	Gun Model Combination	Tip/Aircap
DeVilbliss	JGN-501	QFA-519
Binks	Model 500	Mercury 5C
Graco	205-591	Bulldog

Hose should be 3/8" (0.95 cm) I.D. minimum, but 1/4" (0.64 cm) I.D. whip end section may be used for ease of application. A maximum length of 100 feet (30.5 m) is suggested. Best results will be obtained using a 0.013'-0.017" (0.3-0.4 cm) tip at 1200-1700 psi (83-117 bar).

Note: Nylon or Teflon type packaging are available from pump manufacturer and are highly recommended.

Note: Similar equipment may be suitable.

TYPICAL PROPERTIES

Appearance	Milky white viscous liquid
Coverage at 4-mils (100 microns) - Dry	140-160 ft^2/gal (13-15m^2/l)
pH	9.0-10.0 (Neat)
DFT	2-6 mils (50-150 microns)
WFT	5-14 mils (125-350 microns)
Solids by Volume	32-38 %
Non-volatile Content	36-42 %
Density	8.7-9.0 lb/gal (1.05-1.08 kg/l)

PACKAGING AND STORAGE

MCI Peel-off coating is available in 5 gallon (19 liter) plastic pails, 55 gallon (208 liter) metal drums, totes and bulk. MCI Peel-off coating should be stored in a heated warehouse to avoid freezing. The product has shelf life of up to 12 months.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

Distributed by:

printed on recycled paper 100% post consumer
Revised 4/8/08. Cortec Corporation 2004-2008. All rights reserved. Supersedes: 12/26/06.

MCI®-309

Corrosion Inhibiting MCI Powder for Ferrous Metals

PRODUCT DESCRIPTION

MCI-309 is a Vapor phase Corrosion Inhibitor powder for corrosion protection of ferrous metals in recessed areas, interior cavities, and voids.

MCI-309 provides an extremely efficient dry method to protect metals within an enclosed space. The MCI vaporizes and adsorbs on the metal surfaces, reaching all exposed areas, including recessed sections and interior cavities. It is a mixed inhibitor that provides protection to both the cathodic and anodic sites of metal.

FEATURES

- Does not affect physical properties of concrete or grout (set time, strengths, etc)
- Is safe for high tensile strength steel (will not cause hydrogen embrittlement)
- Does not contain silicates, phosphates, nitrites, or heavy metals
- Provides up to 24 months of continuous protection
- Provides monomolecular inhibiting layer
- Vapor phase inhibiting action protects inaccessible and recessed surfaces
- Protected surfaces do not have to be cleaned prior to concrete or grout placement
- If MCI layer is disturbed by moisture or opening the enclosed space, the layer is replenished by continuous vapor redeposition
- Little or no surface preparation is required
- Prevents further corrosion of pre-coated and painted surfaces
- Easy to apply
- MCI layer does not need to be removed prior to processing or use
- Powder can be removed by air gun or water
- Provides protection to ferrous metals and aluminum
- LD50 ORAL: 2100mg/kg

APPLICATIONS

- Segmental concrete bridges tendons
- Post tensioned Box Girder Bridges
- Tubular structures, pipes, and vessels
- Equipment protection after hydrostatic testing
- Parts, components, and completed assemblies during shipping and storage
- Prestressed tendons

METHOD OF APPLICATION

Apply powder by dusting, fogging, or sprinkling. After application simply cover, close, or seal the interior cavity or void.

Fogging is easily achieved with a low pressure air hose and sandblast cup. Large, conventional sandblasting systems can also be used.

MCI-309 can be removed by using a low pressure air gun or water rinse.

DOSAGE

0.5 oz/ft^3 (500 g/m^3)

METALS PROTECTED

- Carbon steel
- Stainless steel
- Aluminum

TYPICAL PROPERTIES

MCI-309

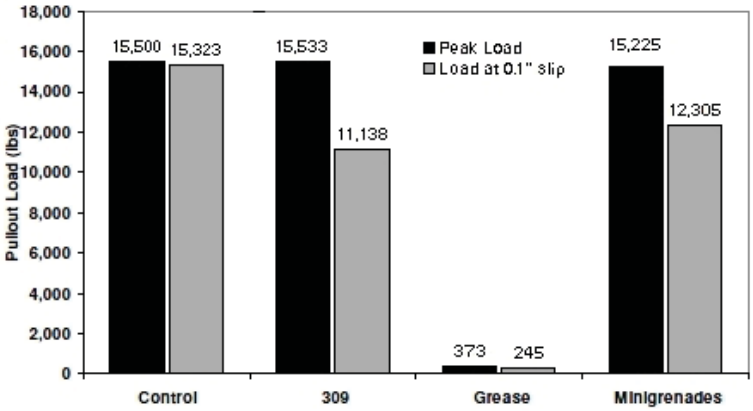
Appearance	White to off-white powder
pH	6.5-8.0 (1% aqueous)
Density	38-39 lb/ft^3 (0.61-0.63 kg/L)

PACKAGING AND STORAGE

MCI-309 is available in 5 pound (2.3 kg), 50 pound (23 kg), and 100 pound (45 kg) lined drums. Store in a sealed container in a dry warehouse avoiding direct exposure to sunlight, with temperature not exceeding 150°F (65°C). Shelf life is up to 24 months.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

Penn State Bond and Corrsoion Testing



According to the Penn State Grouting Laboratory's report MCI-309 reduces corrosion of rebar exposed to salt water by 30%. MCI-309 treated post tension cables that were exposted to environment conditions for 1 year show no significant corrosion.

The graph above shows that MCI-309 does not affect the peak force achieved in the pull-out test. Anti-corrosive grease results in a 98% decrease in both peak force and at 0.1" slip.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer

MCI®-2005 Gel

PRODUCT DESCRIPTION

MCI®-2005 Gel utilizes MCI®-2005 admixture chemistry in a gel format for injection into cracks and cores in concrete. MCI®-2005 Gel is designed to get MCI® molecules closer to embedded reinforcing steel to provide corrosion protection more quickly than surface applied products. It offers the time-proven Migrating Corrosion Inhibitor (MCI®) technology for corrosion protection of reinforcing steel and metals in concrete. MCI®-2005 Gel releases a vapor into the concrete that migrates, seeks out and coats reinforcing steel and metals, stopping further corrosion and extending the service life of the structure.

WHERE TO USE

MCI®-2005 Gel is recommended for:

- Steel-reinforced concrete bridges, exposed to corrosive environments (carbonation, deicing salts and atmospheric attack)
- Parking decks, ramps and garages
- All reinforced marine concrete structures and dams
- Concrete piers, piles, and pillars
- Balconies, decks, retaining walls, and lanais
- Concrete equipment bases
- Structural walls, below grade tunnels and structures
- All reinforced concrete commercial and civil engineered structures

ADVANTAGES

- Offers engineers, owners, contractors, DOTs and government agencies a unique opportunity for corrosion protection that will extend the life of all reinforced concrete structures
- Protects against the harmful effects of corrosion even in the densest concrete
- Required dosage is not affected by chloride concentration
- Economical to install and maintain
- Organic, safe and environmentally friendly
- Concentrated for cost effectiveness on all projects
- Protects both anodic and cathodic areas
- Will migrate to adjacent areas to protect surrounding metals
- Effective against corrosives such as salts, sulfur and nitrogen oxides
- Solves corrosion problems in areas where surface corrosion treatments cannot be used

ESTIMATED HOLES FILLED APPLICATION CHART

	5 gal (19 Liters)	55 gal (208 Liters)	10.3 oz Tubes (0.304 Liters)
3/4”x2” (1.9x5.1 cm)	1307	14379	20
3/4”x3” (1.9x7.6 cm)	871	9586	13
3/4”x4” (1.9x10.2 cm)	654	7190	10
3/4”x5” (1.9x12.7 cm)	523	5752	8
3/4”x6” (1.9x15.2 cm)	436	4793	7
3/4”x7” (1.9x17.8 cm)	373	4108	6
3/4”x8” (1.9x20.3 cm)	327	3595	5
3/4”x9” (1.9x22.9 cm)	290	3195	5
3/4”x10” (1.9x25.4 cm)	261	2876	4

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

APPLICATION

MCI®-2005 Gel is injected into predrilled ¾" (1.9 cm) diameter holes by a hand-held caulking gun or power inductor plate bulk pump, to the level at which the patch will be placed.

APPLICATION CHART

Conventional bridges and parking ramps using standard concrete mix designs specifications similar to ASTM C 1439 should follow this application chart. The depth of the core drilled should equal the depth of reinforcement to be protected.

2" (5.1 cm), approx. 18" (45.7 cm) apart
3" (7.6 cm), approx. 22" (55.9 cm) apart
4" (10.2 cm), approx. 25" (63.5 cm) apart
5" (12.7 cm), approx. 28" (71.1 cm) apart
6" (15.2 cm), approx. 30" (76.2 cm) apart
7" (17.8 cm), approx. 33" (83.8 cm) apart
8" (20.3 cm), approx. 35" (88.9 cm) apart
9" (22.9 cm), approx. 37" (94.0 cm) apart
10" (25.4 cm), approx. 39" (99.1 cm) apart

Note: MCI® corrosion protection starts within a few weeks of installation. The integrity of the structure should be checked by a qualified structural engineer. Placement patterns should be verified by this engineer. Additional spalling of concrete may take place after installation of MCI® due to prior corrosion activity even though corrosion protection by the MCI® has started to work.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

TYPICAL PROPERTIES

Appearance	Dark brown gel
Flash Point	>202°F (100°C)
Shelf Life	12 months in a sealed container
Non-volatile Content	65-75%
Density	10.0-11.0 lb/gal (1.20-1.32 kg/l)

PACKAGING

MCI®-2005 Gel is available in 10.3 oz. (304 mL) caulking tubes, 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes and bulk.

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 products 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 THEREWITH. 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.

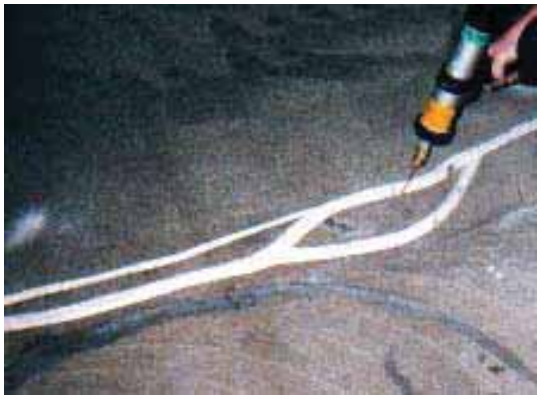
THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. IN NO CASE SHALL CORTEC CORPORATION BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 10/09/06. Cortec Corporation 2002-2006. All rights reserved. Supersedes:6/27/06.

MCI®-2020 Gel



PRODUCT DESCRIPTION

MCI-2020 gel is a an injectable form of corrosion inhibitor, which uses chemistry similar to Cortec's MCI-2020 surface treatment. Utilizing amine carboxylate technology, it offers the time-proven Migrating Corrosion Inhibitor (MCI) for corrosion protection of reinforcing steel and other metals in concrete. MCI-2020 Gel releases a vapor into the concrete that migrates, seeks out, and adsorbs onto metals, stopping further corrosion and extending the service life of the structure.

WHERE TO USE

MCI-2020 Gel is recommended for:

- Steel-reinforced concrete bridges exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack)
- Parking decks, ramps and garages
- All reinforced marine concrete structures and dams
- Concrete piers, piles, and pillars
- Balconies, decks, retaining walls, and lanais
- Concrete equipment bases
- Structural walls, window lintels, below grade tunnels, and structures
- All reinforced concrete commercial and civil engineered structures

TYPICAL PROPERTIES

Appearance	Opaque yellow gel
Shelf Life	24 months in a sealed container
pH	8.5-9.3 (10% water)
Non-volatile Content	25-35%
Density	9.0-9.5 lb/gal (1.03-1.09 kg/l)

ADVANTAGES

- Offers engineers, owners, contractors, DOTs, and government agencies a unique opportunity for corrosion protection that will extend the life of all reinforced concrete structures
- Protects against the harmful effects of corrosion even in the densest concrete
- Required dosage is not affected by chloride concentration
- Economical to install and maintain
- Organic, safe, and environmentally friendly
- Non-flammable, non-combustible
- Concentrated for cost effectiveness on all projects
- Protects both anodic and cathodic areas
- Will migrate to adjacent areas to protect surrounding metals
- Effective against corrosives such as salts, sulfur, and nitrogen oxides
- Solves corrosion problems in areas where surface corrosion treatments cannot be used

ESTIMATED HOLES FILLED

HOLE SIZE	5 gal (19 Liters)	55 gal (208 Liters)	10.3 oz Tubes (0.304 Liters)
3/4"x2" (1.9x5.1 cm)	1307	14379	20
3/4"x3" (1.9x7.6 cm)	871	9586	13
3/4"x4" (1.9x10.2 cm)	654	7190	10
3/4"x5" (1.9x12.7 cm)	523	5752	8
3/4"x6" (1.9x15.2 cm)	436	4793	7
3/4"x7" (1.9x17.8 cm)	373	4108	6
3/4"x8" (1.9x20.3 cm)	327	3595	5
3/4"x9" (1.9x22.9 cm)	290	3195	5
3/4"x10" (1.9x25.4 cm)	261	2876	4

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

APPLICATION

MCI-2020 Gel is injected into predrilled ¾″ (1.9 cm) diameter holes by a hand-held caulking gun or power inductor plate bulk pump, to the level at which the patch will be placed.

APPLICATION CHART

Conventional bridges and parking ramps using standard concrete mix designs specifications similar to ASTM C 1439 should follow this application chart. The depth of the core drilled should equal the depth of reinforcement to be protected.

2″ (5.1 cm), approx. 18″ (45.7 cm) apart
3″ (7.6 cm), approx. 22″ (55.9 cm) apart
4″ (10.2 cm), approx. 25″ (63.5 cm) apart
5″ (12.7 cm), approx. 28″ (71.1 cm) apart
6″ (15.2 cm), approx. 30″ (76.2 cm) apart

Note: MCI corrosion protection starts within a few weeks of installation. The integrity of the structure should be checked by a qualified structural engineer. Placement patterns should be verified by this engineer. Additional spalling of concrete may take place after installation of MCI due to prior corrosion activity even though corrosion protection by the MCI has started to work.

PACKAGING AND STORAGE

MCI-2020 Gel is available in 10.3 oz. (304 mL) caulking tubes, 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes, and bulk.

Store in tightly closed containers.

FOR INDUSTRIAL USE ONLY
KEEP OUT OF REACH OF CHILDREN
KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION
CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 12/6/11. Cortec Corporation 2000-2011. Supersedes: 9/28/06

MCI®-2050

PRODUCT DESCRIPTION

MCI-2050 is a water-based, ready-to-use product developed to prevent the buildup of common construction or industrial "sticky" substances. MCI-2050 forms a thin protective film to which concrete, asphalt, dirt, or other debris will not stick. MCI-2050 can be applied to various equipment (concrete, asphalt, construction, snow removal, etc.), concrete forms, concrete pumping or ready-mix trucks, buses, trains, etc. MCI-2050 contains time-proven MCI technology to inhibit corrosion of a multitude of metals.

WHERE TO USE

MCI-2050 is recommended for:

- Concrete forms as a release agent and corrosion inhibitor
- Concrete ready-mix trucks
- Concrete finishing tools
- Concrete pumping equipment
- Shotcrete, gunite, and spray equipment.
- Concrete and mortar mixes
- Asphalt trucks and equipment
- Farming equipment
- Construction equipment
- Any tools and equipment subject to dirt and dust

ADVANTAGES

- Protects ferrous and non-ferrous metals against corrosion
- Excellent release agent to many sticky substances
- Water-soluble
- Environmentally safe
- Non-flammable
- Safe to use
- Easy to apply
- Effective alternative when diesel, oil, and solvents are not acceptable
- Reduces labor and clean-up costs
- Contains corrosion inhibitors to inhibit corrosion and increase equipment life

HOW TO USE

MCI-2050 can be applied to all surfaces by spray, brush, or roller.

COVERAGE

Application rates vary depending upon surface type. However when applying 3 mils to surface, about 500 ft^2 will be covered per gallon.

PACKAGING

MCI-2050 is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes and bulk.

APPLICATION

Make sure vehicles, forms equipment, and hand tools are clean and free of any concrete, asphalt, dirt, and debris. Wet the surface you wish to protect with MCI-2050, and apply an even film with a clean sprayer, roller, or brush. In most applications MCI-2050 needs to be reapplied everyday when the surface appears dry or non-tacky, especially if equipment will be washed each day.

TYPICAL PROPERTIES

Appearance	Milky white liquid
pH	9.5-10.5 (Neat)
Density	8.2-8.3 lb/gal (0.98-0.99 kg/l)
Non-volatile Content	8-11%
Shelf Life	12 months in a sealed drum

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION

Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer
Revised 1/7/09. Cortec Corporation 2000-2009.

MCI®-2060

PRODUCT DESCRIPTION

MCI-2060 is a cleaner and degreaser that contains Migratory Corrosion Inhibitors® (MCIs). It effectively cleans caked on grease, dirt, oil, and mud on concrete driveways, garage floors, walkways and curbs; making them look like new. MCI®-2060 contains inhibitors which migrate into concrete, providing protection to rebars and all metals in contact with concrete.

FEATURES

- Good for various oils and greases
- Will not damage sealed or painted surfaces
- Non-flammable
- Remains active even if left to dry
- Non-toxic and biodegradable
- May be used at room temperature to reduce energy consumption
- Viscous liquid will cling to ceilings and vertical surfaces in a ready-to-use formulation
- Replaces caustic-based and strong acid-based concrete cleaners
- No special protective equipment needed for application
- Provides corrosion protection for rebars and all metals which are in contact with concrete
- Adjacent areas do not need special protection during application
- Removes cosmoline, transit coatings, and sludge

TYPICAL APPLICATIONS

- Removal of oils, greases, dirt from all concrete and ceramic surfaces
- Cleaning/degreasing of sealed or painted concrete surfaces
- Can be used to neutralize one of Cortec's VpCI® rust removers (VpCI 422, VpCI 423, VpCI 426, etc.)

APPLICATION

For cleaning:

1. Brush, roll, or spray MCI-2060 onto a concrete surface.
2. Use a deck brush to agitate the surface.
3. Allow MCI-2060 time to clean. Depending on how soiled the surface is, it may take several minutes to one hour.
4. Rinse the loosened grime from the concrete surface using water. If possible, use a pressure washer. Floors may also be flooded with water and the debris brushed away or wet-vacuumed up.

TYPICAL PROPERTIES

Appearance	Clear light yellow liquid
Density	8.6-8.7 lb/gal (1.03-1.04 kg/l)
pH	10.9-11.4 (Neat)
Non-volatile Content	18-25%
Usage	1% up to concentrate

LIMITATIONS

The MCI it contains is not designed for long term corrosion protection or to penetrate/migrate distances into concrete. MCI-2060 can only protect reinforcing metal when applied to bare concrete or directly onto the metal.

PACKAGING AND STORAGE

MCI-2060 is available in 5 gallon (19 liter) plastic pails, 55 gallon (208 liter) metal drums, liquid totes, and bulk. Store between 32°F (0°C) and 120°F (49°C).

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

CORTEC CORPORATION

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 6/8/11. Cortec Corporation 2000-2011. Supersedes: 6/10/08.

ISO accreditation applies to Cortec's processes only.

MCI®-2061

PRODUCT DESCRIPTION

MCI-2061 is a powerful cleaner that safely and effectively cleans oil stains on concrete. This hard surface cleaner is unique because it combines powerful cleaning chemistry with microorganisms capable of biodegrading hydrocarbons, such as those found in oil, diesel, and other materials that stain concrete.

MCI-2061 is formulated with biodegradable surfactants and is used like other hard-surface cleaners. During the initial application the cleaning action is simply due to the surfactant component of the product. The microorganisms in MCI-2061 are preserved bacterial spores that remain inactive until MCI-2061 is used. The spores then germinate into vegetative, or active, microorganisms when MCI-2061 is applied to pre-wetted concrete and rinsed according to use instructions. Spores that remain after rinsing germinate and work to degrade residual hydrocarbon constituents of the stain that weren't removed in the initial cleaning process. Spores that are rinsed away may also germinate and work to purify the rinse water.

MCI-2061 is an environmentally friendly alternative that eliminates the need for harsh solvent-based and alkaline cleaners. With biodegradable surfactants, a neutral pH, no solvents and virtually no VOC's (<1%) MCI-2061 makes it easy to maintain a cleaner and healthier facility.

APPLICATION

Spray or pour on area to be cleaned and scrub with broom or brush lightly; spray with water to activate product. Allow product to stand for 6-12 hours, depending on extent of stain damage. For best results scrub before rinsing. Repeat if necessary. Use full strength for heavily stained areas. Since oily stains penetrate deep into porous concrete, several cleanings may be necessary to completely remove aged stains.

FEATURES

- Non-toxic, non-flammable biodegradable cleaner
- Contains virtually no (<1%) volatile organic compounds (no toxic odors)
- Effectively cleans a variety of hard surfaces
- Safer alternative to harsh caustic or acidic cleaners
- Non-corrosive and non-irritating formulation means it's safer for users and the environment.
- Patented and patent-pending technology

PHYSICAL PROPERTIES

Appearance	Creamy off-white liquid
pH	7.0-9.5
Bacteria Count	5.4 x 107 cfu/ml (200 billion/ gal)
Bacteria Type	Spore forming *Bacillus* microbes
Fragrance	Mild odor

PACKAGING AND STORAGE

MCI-2061 is packaged in 5 gallon pails. The shelf life is 2 years with a maximum loss of 1.0 log at recommended storage conditions.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 5/5/11. Cortec Corporation 2007-2011. Supersedes: 1/4/08.

ISO accreditation apples to Cortec's processes only.

PTC Emitters

PRODUCT DESCRIPTION

PTC Emitters contain Migrating Corrosion Inhibitor (MCI®) powder for corrosion protection of post tensioning cables, ferrous and non-ferrous metals in recessed areas, interior cavities, and voids. The pouches are constructed from breathable Tyvek® which allows the VpCI® molecules to be emitted through the membrane and form a molecular layer on metal surfaces providing corrosion protection. PTC Emitters is easy to use; there are no chemical concentrations to calculate, and no need for special equipment for application; just determine the number of pouches required per unit space. PTC Emitters provide a clean method for corrosion protection.

PTC Emitters provides an extremely efficient dry method to protect metals within an enclosed space. The MCI vaporizes and adsorbs on all metal surfaces reaching all exposed areas, including recessed sections and interior cavities.

FEATURES

- Does not contain silicates, phosphates, nitrites, or heavy metals
- Provides up to 24 months of continuous protection
- Vapor phase inhibiting action protects inaccessible and recessed surfaces
- If the MCI layer is disturbed by moisture or opening the enclosed space, the layer is replenished by continuous vapor redeposition
- Protected surfaces do not have to be cleaned prior to concrete or grout placement
- Does not affect physical properties of concrete or grout (set time, strengths, etc)
- Prevents further corrosion of pre-coated and painted surfaces
- Easy to apply

METALS PROTECTED

- Carbon steel
- Stainless steel
- Aluminum
- Galvanized steel
- Zinc
- Copper

TYPICAL APPLICATIONS

PTC emitters are designed to protect ferrous and galvanized PTC cables.
Successful usages include:

- Segmental concrete bridge tendons/cables
- Long term storage of Box Girder reinforcement
- Tubular structures, pipes, and vessels
- Equipment protection after hydrostatic testing
- Parts, components, and completed assemblies during shipping and storage
- Lay-up of construction sites

METHOD OF APPLICATION

Determine the number of pouches required based upon the volume of space needing protection. Evenly distribute pouches throughout the space and close or seal enclosure.

MCI® MIGRATING CORROSION INHIBITORS FROM GREY TO GREEN

PACKAGING AND STORAGE

Unit Size Volume Protected	Pouch Dimensions
35 ft^3 (1m^3)	6” x 7” x 0.5” (15.3 cm x 17.8 cm x 1.3 cm)

PTC Emitters are available in a size that protects up to 1m^3. PTC Emitters are packaged in cartons of 50 units. Do not store in conditions above 150°F (65°C). Close cartons between uses. The shelf life of unopened cartons of PTC Emitters is up to 24 months.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

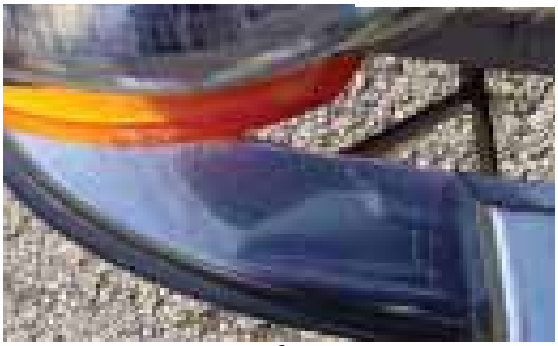
printed on recycled paper 100% post consumer
Revised 11/2/09. Cortec Corporation 2009. All rights reserved. Supersedes: 5/22/09.

VpCI®-422

USDA CERTIFIED BIOBASED PRODUCT
PRODUCT 92%

NSF
Nonfood Compounds
(Category Code: A3)
(Registration #147181)

Before



After

PRODUCT DESCRIPTION

VpCI-422 effectively removes rust and tarnish from steel, iron, copper, brass, and chrome. VpCI-422 removes corrosion from metal without creating wast disposal difficulties and is milder to people than traditional rust remover.

VpCI-422 G is a modification of VpCI-422, which is recommended for galvanized steel.

It will not harm human skin or adversely affect most paints, plastics, wood, textiles, ceramics, or rubber when used as recommended. Removing corrosion from metal is easy; just apply VpCI-422 and rinse with water.

VpCI-422 is completely organic, 100% biodegradable and does not require special disposal for typical use. It is especially helpful for outdoor and marine applications where chemical waste disposal can be a problem. In rare situations, waste treatment may be required if a sufficient quantity of pollutants are introduced into the chemical solution.

Unlike conventional rust removers, which can be extremely dangerous to use, handle, and store; VpCI-422 is so mild that minimal protective covering is needed. In addition, the non-toxic, non-flammable formulation has no pungent acid or caustic fumes. Being nearly odorless and extremely mild makes VpCI-422 easy and safe to use. In contrast to harsh industrial chemicals, VpCI-422 can be used in labor-intensive areas such as continuous assembly and packaging lines with no adverse effect on production efficiency.

FEATURES

- Removes rust and corrosion from ferrous and non-ferrous metals.
- Prevents flash rusting.
- Completely organic and biodegradable.
- Non-polluting and environmentally acceptable; check with local authorities for disposal guidelines.
- Loosens rust-frozen parts.
- Safe-to-handle, use and store.
- No adverse effects on most paints, plastics, wood, textiles, ceramics, and rubbers.
- Safe, non-toxic, non-flammable formulation and mild odor makes it ideal for in-plant use.
- NSF (A3) Registered. Acceptable for use as an acid cleaner in and around food processing areas for indirect food contact.
- Passes ASTM F-519-05 "Mechanical Hydrogen Embrittlement Evaluation of Plating/Coating Processes and Service Environments"

TYPICAL APPLICATIONS

- In-process rust removal for parts and metal stock.
- Interior and exterior surfaces of tanks and vessels.
- Outdoor machinery and equipment.
- Trucks, cars, and other vehicles.
- Automotive, marine, farm parts, and equipment.
- Fences, railings, and walls.
- Tools, locks, and rust-frozen parts.

CORTEC CORPORATION
Environmentally Safe VpCI® MCI® Technologies

APPLICATION

VpCI-422 can be applied using spray equipment including air and airless spray as well as by brush or dip. For spray, brush, or roll-on application; remove loose rust or tarnish. Then apply VpCI-422 concentrate to surface, let chemical stand for 10 to 15 minutes, and rinse with an alkaline solution (Cortec® VpCI-410 series). Typically, little or no rubbing is required. Reapply if necessary.

Medium and heavy rust will take somewhat longer.

For dip application, remove heavy deposits, loose rust, or tarnish. Soak part(s) in a tank as long as required to remove corrosion. Remove part(s) from tank and rinse with an alkaline solution (Cortec® VpCI-410 series). Increasing temperature up to 150°F (65°C) will speed the cleaning process.

PHYSICAL PROPERTIES

VpCI-422	
Appearance	Dark amber to brown liquid
Non-volatile Content	27-33%
Odor	Light
pH	1.7–2.5 (neat)
Weight per Gallon	9.3–9.6 lb/gal. (1.11–1.15 kg/l)
VpCI-422 G	
Appearance	Dark brown liquid
Non-volatile Content	27-35%
Odor	Light
pH	6-8 (neat)
Weight per Gallon	9.4-9.7 lb/gal. (1.13–1.16 kg/l)

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

NOT FOR INTERNAL CONSUMPTION

CONSULT SAFETY DATA SHEET FOR MORE INFORMATION

TESTING RESULTS

Biodegradability, 28 days[1]

Requirement to consider material biodegradable	Result
>60%	66.67%

[1]According to 405.1 EPA 600/4-79-020; performed by Maxim Technologies Inc.

Toxicological Testing Results*
(Performed by certified ABS Laboratories Inc.)
Marine Toxicity

Test Species	Results (LC-50)** ppm. 48 hours
Sheepshead Minnow (Cyprinodon Variegatus)	707
Americamysis bahia	107
Sceletonema castatum	72 (EC-50)**

Bioaccumulation Potential (Log Octanol/water partition coefficient, POW)

Requirement	Result
>3	-6.44

*Testing performed in compliance with OECD (Organization for Economic Cooperation and Development) Principles of Good Laboratory practices.
** LC-50/EC-50 – 50% of Lethal concentration/50% of Effective Concentration respectively.

PACKAGING AND STORAGE

VpCI-422 and VpCI-422G are available in 5 gallon (19 liter), 55 gallon (208 liter) drums, totes, and bulk. Store product in a heated warehouse to avoid freezing.

Minimum storage temperature: 32°F (0°C)
Maximum storage temperature: 120°F (49°C)

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 products 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 THEREWITH. 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.

Distributed by:

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

VpCI®-423 Gel

PRODUCT DESCRIPTION

VpCI-423 is a rust remover that is harmless to people while effectively removing rust and tarnish from steel, iron, copper, brass, chrome, and aluminum. VpCI-423 removes corrosion from metal without creating waste disposal difficulties.

When used as recommended, VpCI-423 will not harm human skin or adversely affect most paints, plastics, wood, textiles, ceramics, or rubber. Removing corrosion from metal is easy. Apply VpCI-423 and rinse with water then use Cortec® VpCI-414 or VpCI-419 for added protection.

VpCI-423 is completely organic and 100% biodegradable, and does not have special disposal requirements for typical use. Waste treatment may be required if a sufficient quantity of pollutants (oil, solvents, dirt, grease) are introduced into the chemical solution.

Unlike conventional rust removers which can be extremely dangerous to use, handle, and store; VpCI-423 is so mild that minimal protective covering is needed. In addition, the non-toxic, non-flammable formulation has no pungent acid fumes. Being nearly odorless and extremely mild makes VpCI-423 easy to use.

VpCI-423 is formulated to stay in place for special applications that require the chemical to cling to vertical surfaces or the underside of horizontal surfaces. VpCI-423 makes it easy to remove rust from tanks, vessels, outdoor machinery and equipment, walls, fences, railings, and vehicles.

FEATURES

- Removes rust and corrosion from ferrous and non-ferrous metals
- Prevents flash rusting
- Completely organic and biodegradable
- Non-polluting and environmentally acceptable for easy disposal
- Loosens rust-frozen parts
- Cleans rust stains from painted, wooden, and other surfaces
- Safe to handle, use, and store
- No adverse effects on most paints, plastics, wood, textiles, ceramics, and rubbers
- Safe, non-toxic, non-flammable formulation and mild odor makes it ideal for in-plant use
- Gel form allows application on vertical or upside-down horizontal structures
- Accepted by USDA for use as an acid cleaner in food plants (indirect contact with food)
- NSN 6850-01-482-4536

TYPICAL APPLICATIONS

- In-process rust removal for parts and metal stock
- Interior and exterior surfaces of tanks and vessels
- Outdoor machinery and equipment
- Trucks, cars and other vehicles
- Automotive, marine and farm parts and equipment
- Fences, railings, and walls
- Tools, locks, and rust-frozen parts

CORTEC CORPORATION
Environmentally Safe VpCI™/MCI® Technologies

APPLICATION

VpCI-423 can be applied using spray equipment, including air and airless spray, as well as by brush dip.

For spray, brush, or roll-on applications; remove loose rust. Then apply VpCI-423 concentrate to the surface, let product stand for 10-15 minutes and rinse with Cortec® VpCI-410 series (typically, little or no rubbing is required). Reapply if necessary. Medium and heavy rust will take somewhat longer.

For dip application; remove heavy deposits, loose rust, or tarnish. Soak part(s) in tank as long as required to remove corrosion. Remove from tank and rinse with Cortec® VpCI-410 series (VpCI-414/416) for added protection.

Increasing temperature up to 110ºF (43ºC) will speed the cleaning process.

PHYSICAL PROPERTIES

Appearance	Dark brown gel
Non-volatile Content	36-45%
Density	9.6-10.0 lb/gal (1.16-1.19 kg/l)

RECOMMENDED SPRAY APPLICATION

For good atomization and spray pattern, use the following:

- Graco Air Assisted Airless High Pressure Gun, Model AA Plus
- Pump - 41:1 SST Bulldog, SP 5 gallon (19 liter) Ram with ram SSP plate extension
- Adapter - SST ram plate or 55 gallon (208 liter) DP ram and SST ram plate
- Tip - 715 (SST)
- Hose - 3/8" x 25' Teflon (5 cm x 7.6 m)
- Cap - Standard with high flow needle and seat operating pressure of 3300 psi (228 bar)
- Filter - HP SST 100 mesh

PACKAGING AND STORAGE

VpCI-423 is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes, and bulk. Store in a heated warehouse to avoid freezing.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

Distributed by:

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

printed on recycled paper 100% post consumer
Revised 3/2/09. ©Cortec Corporation 1998-2009. All rights reserved. Supersedes: 7/18/08.

VpCI®-426 / VpCI®-426 Powder

PRODUCT DESCRIPTION
VpCI-426 is a water-based heavy duty concentrate designed to remove corrosion, scale, and naturally occurring oxides from iron, carbon and stainless steel, copper, aluminum, magnesium, and their alloys.

VpCI-426 not only removes corrosion and scale, but also brightens aluminum and copper. So safe, VpCI-426 can be used for household tasks.

TYPICAL USES/FEATURES
- Rust remover for ferrous metals
- Preparation of aluminum surfaces before anodizing, painting, and electroplating
- Oxide removal of brass, bronze, copper, zinc, magnesium, and magnesium alloys
- Brightener for aluminum and copper
- Scale build-up remover from bathroom tubs, showers, and pipes
- Household corrosion removal needs
- NSN 6850-01-477-4155

ADVANTAGES
- Very effective on a variety of metals to dissolve rust, scale, and oxide deposits
- Reduced costs of surface preparation
- Increased performance over equivalent products
- Used in areas that can not be sandblasted or cleaned with power tools
- User friendly, non-toxic, and nitrite-free
- Safe to use for household tasks
- Available in the powder form (VpCI-426 powder)

APPLICATION VpCI-426 liquid (examples)
Steel*:
Use 1 part of VpCI-426 to 4 parts water.

Copper:
Use concentrate or 1:1 dilution with water.

Aluminum:
Heavy cleaning
Apply concentrate at room temperature or 1 part VpCI-426 to 1 part water at elevated temperature (120°F/49°C).

Normal cleaning
Use 1 part VpCI-426 to 1 part water.

Magnesium and alloys:
Use 1 part VpCI-426 to 4 parts water at room temperature (cleans in approximately 1-2 minutes).

APPLICATION VpCI-426 Powder
Use 7% (by weight) in water.

*Once corrosion has been removed, it is advised to use Cortec VpCI®-414 (1:5 and 1:10 dilutions) to rinse away any residue and prevent the metal surface from flash rusting.

CORTEC CORPORATION
Environmentally Safe VpCI® MCI® Technologies

TYPICAL PROPERTIES

Liquid

Appearance	Clear colorless liquid
Density	8.9-9.1 lb/gal (1.07-1.09 kg/l)
Non-volatile Content	20-26%

Powder

Appearance	Off-white/beige powder
pH	2.5-3.5 (1% aqueous)
Non-volatile content	95-100%

PACKAGING AND STORAGE

VpCI-426 (liquid) is available in 5 gallon (19 liter) pails, 55 gallon (208 liter) drums, liquid totes, and bulk. VpCI-426 Powder is available in 5 lb (2.3 kg), 50 lb (23 kg), and 100 lb (45 kg) bags.

Minimum storage temperature: 32°F (0°C)
Maximum storage temperature: 120°F (49°C)

Toxicological Testing Results

VpCI-426

Test Species	NOEC/LOEC, ppm	48-hr LC50*, ppm
D. pulex	100/1000	316
P. promeias	100/1000	316
M. beryllina	100/1000	316
M. bahia	10/100	31.6

VpCI-426 Powder

Test Species	NOEC/LOEC, ppm	48-hr LC50*. ppm
D. pulex	100/1000	316
P. promelas	100/1000	316
M. beryllina	100/1000	316
M. bahia	100/1000	316

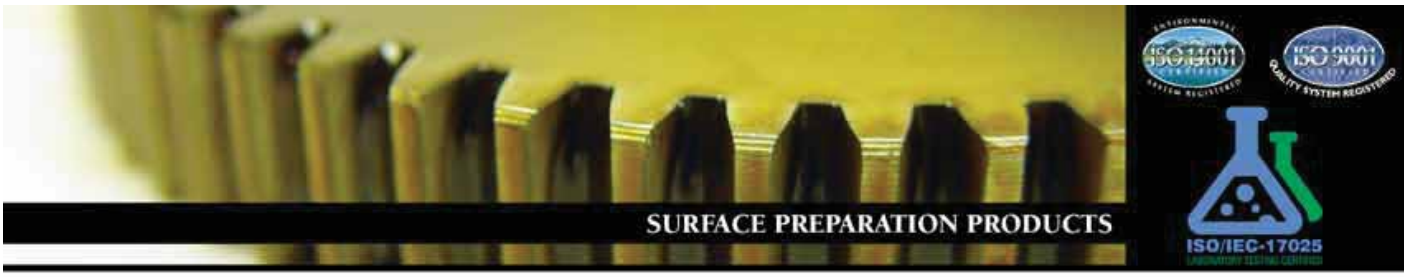
* LC50/EC50-50% of Lethal concentration of Effective Concentration respectively

FOR INDUSTRIAL USE ONLY
KEEP OUT OF REACH OF CHILDREN
KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION
CONSULT SAFETY DATA SHEET FOR MORE INFORMATION

Distributed by:

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

printed on recycled paper 100% post consumer
Revised: 8/9/13. ©Cortec Corporation 2000-2013. Supersedes: 4/4/12.



VpCI®-426 Gel

PRODUCT DESCRIPTION
VpCI-426 Gel removes corrosion, scale, and naturally occurring oxides from iron, carbon and stainless steel, and their alloys.

VpCI-426 Gel stays in place on vertical and difficult to treat surfaces where corrosion is heavy, allowing extra time for VpCI-426 Gel to remove corrosion from the metal surface.

TYPICAL USES
- Removes corrosion from ferrous metals and copper
- Oxide removal of brass, bronze, copper, and zinc

ADVANTAGES
- Very effective on carbon steel and stainless steel to dissolve rust, scale, and oxide deposits
- Reduced toxicity and costs
- Increased performance over equivalent products
- Can be used in areas that can not be sandblasted or cleaned with power tools
- Non-toxic and nitrite free

APPLICATION
Use* on mil scale, overnight cleaning, and vertical/ overhanging areas. Once corrosion has been removed it is advised to use Cortec® VpCI-414 (1:5 and 1:10 dilutions) to rinse away any residue and to prevent the metal surface from flash rusting.

*Time to remove problem areas will vary with temperatures and substrate.

PHYSICAL PROPERTIES

Appearance	Clear gel
Density	8.7-9.0 lb/gal (1.04-1.08 kg/l)
Non-volatile Content	25-30%

PACKAGING
VpCI-426 Gel is available in 5 gallon (19 liter) pails and 55 gallon (208 liter) drums. The minimum storage temperature is 32°F (0°C). The maximim storage temperature is 100°F (38°C).

CORTEC CORPORATION
Environmentally Safe VpCI® MCI® Technologies

FOR INDUSTRIAL USE ONLY
KEEP OUT OF REACH OF CHILDREN
KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION
CONSULT SAFETY DATA SHEET FOR MORE INFORMATION

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 products 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 THEREWITH. 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.

Distributed by:

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

printed on recycled paper 100% post consumer
Revised: 9/27/13. ©Cortec Corporation 2000-2013. Supersedes: 2/14/13.