MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

Cortec® MCI® Team Builds Concrete Skills

Cortec® MCI® regional sales reps for Europe, Canada, and the Southeastern and Western regions of the U.S. joined VP of MCI® Sales, Jessi Meyer, in June at Cortec® World Headquarters for a time of collaboration and skill-building. A highlight of the experience was hands-on training in practical tools and talents needed out on the jobsite. Technical Service Engineer Casey Heurung gave instruction on using the GalvaPulse to take rebar corrosion rate readings at concrete repair sites and how to detect the location of rebar under the concrete surface using a GSSI StructureScan Mini XT. Later, Alan Jolley, MCI® Regional Sales Manager for the Southeastern U.S., used his extensive industry knowledge to demonstrate the mixing and application of MCI®-2702 repair mortar and MCI®-2023 passivating grout. Everyone on the team had the opportunity to dig their hands into fresh repair mortar and actually practice applying product themselves, so they will be better prepared to help distributors and customers on the jobsite.

The GSSI StructureScan Mini XT is a laser device that can be rolled across concrete surfaces to detect the general location of rebar beneath the concrete cover.

Technical Service Engineer Casey Heurung demonstrates how to use a GalvaPulse to monitor corrosion rates in rebar.

MIGRATING CORROSION INHIBITORS
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MCI® News

Repair Mortar Demo: Saturating the concrete surface with water before applying repair mortar is a critical part of making the mortar adhere.

Applying passivating grout to a sample panel of steel. Passivating grout acts like a glue to help repair mortar adhere better to steel rebar.

The MCI® sales team takes a break after practicing repair mortar and passivating grout application. Left to right: Ivana Liposcak (MCI® Technical Sales Manager, Europe), Jessi Meyer (VP of MCI® Sales), Alan Jolley (MCI® Southeast Regional Sales Manager, U.S.), Ashraf Hasania (MCI® Technical Sales & Market Manager, Canada), Reem Assaf (MCI® Western Regional Sales Manager, U.S.).

MIGRATING CORROSION INHIBITORS
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MCI® News

Cortec® Welcomes MCI® Visitors to Snowy Minnesota

A winter storm with a 5-6 inch (12.7-15.24 cm) snowfall in the Minneapolis/Saint Paul, MN, metro area March 5th did not stop Middle Eastern and South American visitors from keeping their MCI®-related appointments at Cortec® Headquarters (CHQ) the following day.

On March 6th, Cortec® welcomed a guest from Dubai Central Laboratories to audit Cortec's facility for Dubai Municipality admixture specifications. CHQ passed the factory audit with no non-conformances. Final approval awaits one more test in Dubai.

The same day, engineers from Brazil and Ecuador also visited Cortec® World Headquarters to complete two-day training with a specific focus on MCI®. Cortec® was honored to host Engineer Douglas Couto of the prestigious Brazilian engineering firm, PhD Engenharia Ltda., created by Professor Paulo Helene and specializing in understanding and solving "concrete pathologies"; Engineer Francisco Hidalgo, Managing Director of Codemet, Cortec® distributor in Ecuador; and Engineer Matheus Rocha da Silva of CorrSolutions, Cortec® distributor in Brazil. In addition to learning about the advantages of MCI® for prolonged concrete durability and how to use Life-365 service life predicting software to simulate concrete parameters in local climatic conditions, the visitors were able to visit the CHQ manufacturing floor and R&D lab. They also enjoyed a traditional Minnesota dinner attended by Boris Miksic (Cortec® CEO) and his wife, Ines.

The three engineers followed up their Minnesota adventures with a trip to California State University – Northridge, where they learned more about MCI® testing performed in the well-equipped lab of Dr. Behzad Bavarian.

MCI® audit team: Ashraf Hasania (MCI® Technical Sales & Market Manager), Dubai auditor, Jessi Meyer (VP MCI® Sales), Debbie Hannan (Director of Quality & Safety), Reem Assaf (MCI® Western US).


VP of International Sales, Dario Dell'Orto, with engineers from South America.

Dr. Bavarian Presents MCI® Paper at NACE International CORROSION 2018 Convention

The NACE International convention took place April 15th-19th in Phoenix, Arizona. Among the presentations given was a paper by Dr. Behzad Bavarian (California State University – Northridge) on "Migrating Corrosion Inhibitors to Protect Reinforced Concrete Structures." The paper discussed how MCIs based on a blend of amine carboxylates and amino alcohols demonstrate protection against corrosion at the level of embedded steel rebar even in the presence of chlorides. The full paper can be read here: https://www.cortecvci.com/Publications/Papers/C2018-11011.pdf

MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

MCI® News

Cortec® Shares MCI® Technology in Albania

The Cortec®/EcoCortec® team has been busy sharing MCI® Technology solutions with major companies in Albania. To facilitate networking, the Croatian Embassy in Tirana introduced Cortec® to CroTeam, an organization working to connect Croatian and Albanian companies. Over the few days of their visit, Cortec®/EcoCortec® were able to meet and talk with more than 10 major Albanian construction, engineering, and ready-mix companies. They were also able to present MCI® Technology to key individuals from the major port authority of Durres, where four new port terminals are being designed.

MCI® Technology is new to the region, and infrastructure is seeing heavy expansion. The MCI® concept was received with interest by everyone from state-owned to private companies. Company leaders suggested organizing educational workshops to teach engineers and potential clients about the technology and its use in different applications, something Cortec®/EcoCortec® would like to do in the future. Cortec®/EcoCortec® is hoping to expand the reach of MCI® to all three markets of Albania, Macedonia, and Kosovo where many of these companies work.

Cortec® MCI® Welcomes Civil Engineer to Counter Concrete Corrosion in the Western U.S.

Cortec® Corporation is pleased to welcome Reem Assaf as its new MCI® Regional Sales Manager for the Western U.S. region. She holds a BSc in Civil Engineering and has 13 years of experience in the construction industry, working with contractors and consultants while specializing in project management and business development.

Prior to joining Cortec® in December 2017, Assaf was a specification manager for Cortec® Middle East, helping customers secure solutions to counter the harsh corrosive conditions of the region. Drawing on her rich experiences, Assaf is eager to provide a unique perspective on Migrating Corrosion Inhibitor™ solutions for a wide range of concrete repair and maintenance projects in the Western U.S.

MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

MCI® News

MCI® Gains Footing in Swedish Construction Market

In the interest of expanding the use of MCI® in Europe, regional MCI® Technical Sales and Market Manager Ivana Liposcak has been working to help Sweden adopt MCI® corrosion inhibitors as a viable method for extending service life of reinforced concrete. For the last two years, Liposcak has been working closely with Nils Davant of CBI Concrete Institute Ltd, a leading company in the Swedish construction sector where Liposcak was invited to give a presentation on Cortec's MCI® Technology. The company was intrigued by the technology and is eager to promote its use in the Swedish construction market. For even greater impact in the market, Davant recently established his own company, National Concrete Innovations (NCI), and in April signed an agreement with Cortec® to become an MCI® rep.

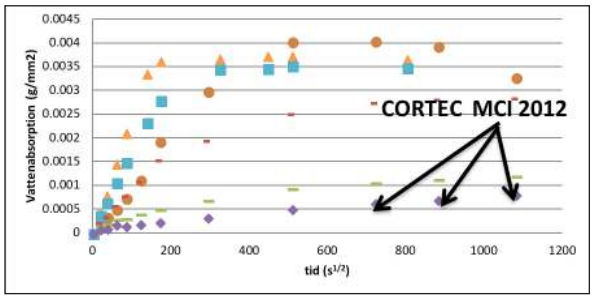
The biggest challenges in Sweden are (1) convincing traditional-minded concrete experts that corrosion inhibitors could be the solution to stopping concrete structures from degrading as quickly as they currently do and (2) raising awareness that this technology has been in use for decades. Of late, the popular route to improve concrete service life in Sweden has been to employ a thicker concrete cover. Unfortunately for users, this results in more expensive concrete that produces many cracks, which complicate the problem by distributing water and chlorides into the concrete. Another problem is the common use of a low water-cement ratio that demands very effective water curing after casting but does not typically receive the proper treatment.

In order to challenge the status quo in the market and help construction experts realize the benefits of MCI® products, Nils Davant has been instrumental in starting Swedish financed research in this field. His efforts have led to the use of MCI® products in two research projects currently running at RISE (Research Institutes of Sweden).

Ivana Liposcak (Cortec® MCI® Technical Sales & Market Manager, Europe) with Nils Davant (CBI) in front of the Swedish research institute responsible for performing ongoing MCI® tests. Davant recently established his own company, National Concrete Innovations (NCI), and in April signed an agreement with Cortec® to become an MCI® rep.

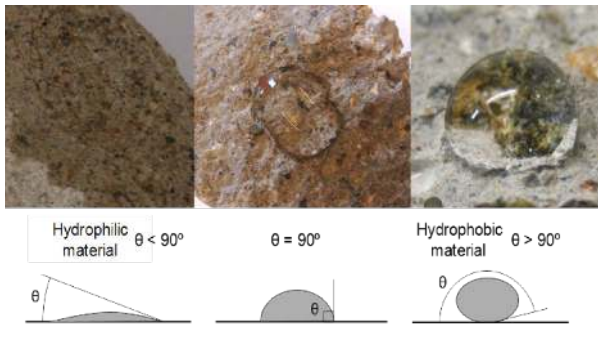
The first project involves finding a solution to problems with corrosion in steel molds used for concrete casting. Corrosion on the molds leaves behind concrete surfaces that are discolored and uneven. This problem has occurred for a long time, predominantly in the precast industry. One reason for the corrosion could be the shift from mineral-based mold release oils to water-based oil emulsion release agents. Another factor the project is investigating is the effect of new cement types on the market, including those that use fly ash. Cortec® has joined in to support this project by providing MCI® Creteskin and MCI®-2050 for testing. Results so far show that the Cortec® products have outstanding performance as corrosion inhibitors.

The second ongoing research project, entitled "Hydrophobic Concrete for Nordic Civil Infrastructure," is investigating the effects of using hydrophobic admixtures in concrete bridges. This project is scheduled to run from 2017-2019 and is chiefly financed by Swedish road authorities. A new version of MCI®-2012 is included in this project, which focuses on hydrophobic effects, water absorption, chloride migration, and frost resistance. Changing concrete from hydrophilic to hydrophobic creates a lower moisture environment that reduces the probability of various deterioration processes being initiated. So far, the test has shown low water absorption for concrete containing the new version of MCI®-2012 compared to a higher water absorption in the reference concrete.



Water absorption of Cortec® MCI®-2012 variation. Image courtesy: RISE (Research Institutes of Sweden).

Water absorption testing on a bridge in Stockholm. Steel cages prevent theft and physical damage. The MCI®-2012 specimen is in the upper right corner. Image courtesy: RISE (Research Institutes of Sweden).



Concrete with and without a hydrophobic admixture: Dropping water onto a concrete surface shows if a hydrophobic admixture has been included in the concrete.

MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

MCI® News

MCI® Solutions Presented at Major European Parking Expo

This year's largest dedicated parking event for Europe took place June 13th-14th in Coventry, England. Cortec® distributor Lake Corrosion Engineering was there with an excellent booth to present Cortec® MCI® solutions for enhancing the durability of parking structures.

Image courtesy: David Kitchin

The World Cup and MCI®

The surprise 3 to 0 victory of Croatia (population: 4 million; size: 56,593 km^2 [21,851 mi^2]) over Argentina (population: 44 million; size: 2,781,647 km^2 [1,074,000 mi^2]) in the World Cup June 21st was noted around the world. This included the lighting of the world's tallest tower, Burj Khalifa in Dubai, UAE, in the colors of Croatia. For Cortec®, founded by Croatian-American Boris Miksic, this holds an even deeper significance since Burj Khalifa is one of the projects where MCI®-2005 admixture was used to enhance the durability of the reinforced concrete substructure in order to help meet specifications for a 100 year design life.

FIFA WORLD CUP
RUSSIA 2018

Photos by Damiur Korjenić, https://www.index.hr/magazin/clanak/kakav-prizor-burj-khalifa-u-bojama-hrvatske/2006207.aspx

MIGRATING CORROSION INHIBITORS
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MCI® News

Concrete and Alcatraz Provide Interesting Mix at Spring ICRI Convention

This year's ICRI Spring Convention, April 11th-13th in San Francisco, California, provided a unique change from the normal with the opportunity to learn about concrete restoration at Historic Alcatraz! The Concrete Preservation Institute (CPI) is partnering with the U.S. Military and National Park Service to help active duty military personnel transition to civilian life by teaching them transferrable job skills. Alcatraz is one of three national park locations where CPI is doing concrete repair training. During ICRI, Reem Assaf (MCI® Regional Sales Manager, Western Region) and distributor RaeJean Nicholl (SMART) both went on an insider's tour of the island where they learned more about CPI's training program at this national landmark. Jessi Meyer (VP of MCI® Sales) wasn't able to take the tour but enjoyed attending a luncheon presentation by Tonya Komas, the CEO of CPI.

As an active member of ICRI, Meyer stayed busy going to the standard corrosion inhibitor, marketing, and service life durability meetings for the various committees she's part of and also had the honor of accepting the ICRI outstanding chapter of the year award on behalf of the MN ICRI chapter.

Fielding questions at the booth, Assaf had the opportunity to explain MCI® Technology to many different attendees, including students from New Jersey Technical Institute who are enrolled in the CIM (Concrete Industry Management) program and are preparing to be future leaders in the concrete industry!

Reem Assaf educating students from NJIT.

ICRI Outstanding Chapter Awards.


Historic Alcatraz.

Case Histories

Elite 9, Dubai Sports City: Enhancing Piling Durability

A 15-story residential tower being built in Dubai Sports City was designed with reinforced concrete piles that would be partially submerged in underground water. To provide extra protection and enhance durability in this corrosive environment, MCI®-2005 was approved for use and was admixed into more than 5,500 cubic meters (7,193.73 yd^3) of concrete used in the structure's piles.

Read more: https://www.corteccasehistories.com/?s2member_file_download=access-s2member-level1/ch574.pdf

MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

Case Histories

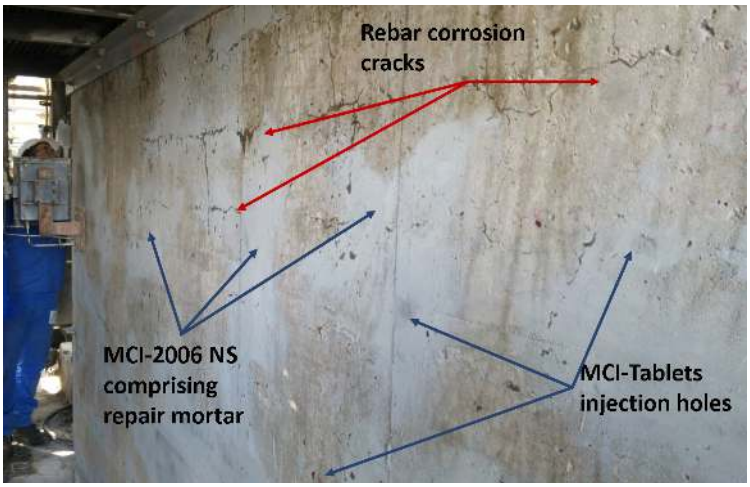
Restoration of Concrete Foundations at Carmel Olefins

As is common in chemical saturated environments, rebar corrosion had caused cracking and delamination on dozens of cubic meters of concrete foundations that support heavy equipment at a polyethylene/polypropylene plant in Israel. A long-term renovation solution was needed that would not stop the plant's production. The plan included three different aspects.

1. Deeply embedded rebar were protected by drilling four deep but narrow holes per square meter and inserting 100 MCI® Tablets into the holes at 100 units per cubic meter (1.3 yd^3) of concrete. The holes were capped with repair mortar containing MCI®-2006 NS.
2. Delaminated concrete was removed and chiseled to a depth of 2 cm (0.8 in) beyond the level of the rebar. Exposed rebar was cleaned, and new patches were placed using low shrinkage repair mortar containing MCI®-2006 NS.
3. Undamaged concrete surfaces were protected against future corrosion by applying MCI®-2020 at 0.27 liters per square meter (0.05 pt/ft^2).

This unique treatment option provided a dual solution for restoration and future protection without requiring plant production to stop.

Read more: https://www.corteccasehistories.com/?s2member_file_download=access-s2member-level1/ch593.pdf



Abraj Residential Towers

A project consisting of four residential towers in Pearl, Qatar, faced the challenge of high chlorides in the soil, putting the substructures at greater risk for steel reinforcement corrosion. In order to enhance durability and achieve the structural service life required for the project, MCI®-2005 was admixed into more than 30,000 cubic meters (39,239 yd^3) of concrete used in substructure elements such as the buildings' rafts, retaining walls, and water tanks.

Read more: https://www.corteccasehistories.com/?s2member_file_download=access-s2member-level1/ch582.pdf

MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

Case Histories

Restoration of CorteCros® Ltd. Warehouse

The CorteCros® warehouse was in serious need of exterior restoration after forty years of exposure to the harsh marine environment near the port of Split, Croatia. With walls and façade in very bad condition and metal entrance doors peeling, restoration of the unsightly building was inevitable. Restoration took place in several steps.

1. Peeling paint and dirt were pressure washed off the walls using MCI®-2060 Concrete Cleaner/Degreaser diluted 15%.
2. A repair mortar containing MCI®-2006 NS was applied to damaged wall areas as needed.
3. Two 60 micron layers each of MCI® Architectural Coating Gray and MCI® Architectural Coating Green were applied to the façade and trim, respectively.
4. Corroded door surfaces were coated with CorrVerter® rust converting primer and covered with VpCI®-386 Green when dry.

With the restoration complete, CorteCros® expects to get an additional 15-20 years of service life out of the building. Read more: https://www.corteccasehistories.com/?s2member_file_download=access-s2member-level1/ch597.pdf

CORTECROS d.o.o.
A Subsidiary of Cortec® Corporation

Enhancing Durability of the Halona Street Bridge

Hawaii DOT (HDOT) needed to replace the Halona Street Bridge, a reinforced concrete bridge that had been built over the Kapalama Canal in 1938 and was deteriorating after seven decades of use. Because of its location not far from the Honolulu Harbor and the Pacific Ocean, MCI®-2005 NS was admixed into 90% of the two concrete mixes used for the pre-cast, pre-stressed replacement bridge. The new bridge was designed to have a 75-year life span and is expected to carry 5,900 vehicles per day by the year 2036. The use of MCI®-2005 NS will be an important contributing factor to enhancing the durability of the bridge in a tropical Pacific coastal climate. The good physical properties and lower environmental impact of MCI®-2005 NS also made it an excellent alternative to other corrosion inhibiting admixtures, such as calcium nitrite, for use in an environment connected to waterways.

Read more: https://www.corteccasehistories.com/?s2member_file_download=access-s2member-level1/ch601.pdf

MIGRATING CORROSION INHIBITORS
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Case Histories

Restoration of Saint Donatus Church

Saint Donatus church in the city of Zadar, Croatia, is one of the country's most famous monuments as well as one of Europe's most significant pre-Romanesque churches, dating from the 9th century AD. It has been nominated for inclusion on the UNESCO list of World Heritage Sites and is notable for its unusual cylindrical appearance and cultural significance. Today the church is in need of urgent rehabilitation as a result of numerous factors. After 3D scanning analyses, it was determined that the biggest issues are the church walls, roof, and construction itself. During the period of 1927-1930, the stability of the foundation was compromised and a reinforced concrete support structure was implemented under the roof from the south side, connecting the inner and outer rings of the church. Moisture penetrates into the medieval monument and, combined with sea dust, very seriously endangers the reinforced concrete structure that supports the church of St. Donatus. As part of the repair project initiated last year, Cortec's MCI®-2020 surface applied corrosion inhibitor treatment was specified as a coating to protect the support structure against corrosion. MCI®-2020 is designed to migrate through the concrete to provide protection at the level of the rebar.

Read more: https://www.cortecvci.com/whats_new/announcements/historic-monuments.pdf

Maslenica Bridge Restoration

The Maslenica Bridge in Croatia (built in 2004) is one of the largest bridges of its type with an arc of 200 meters (218.7 yd) in diameter. Because of the aggressive environment of changing temperatures, constantly fluctuating humidity, and strong wind containing salt from seawater, reinforcing steel had started to corrode, causing concrete spalling. To restore the bridge and prevent future corrosion from happening, all spalling concrete was water-blasted off, along with dirt and corrosion on the rebar. CorrVerter® MCI® Rust Primer was brushed on exposed rebar to passivate the metal from further corrosion, and MCI®-2020 was applied to the entire concrete structure using an airless sprayer to prevent any potential corrosion that was not apparent.

Read more: https://www.corteccasehistories.com/?s2member_file_download=access-s2member-level1/ch595.pdf

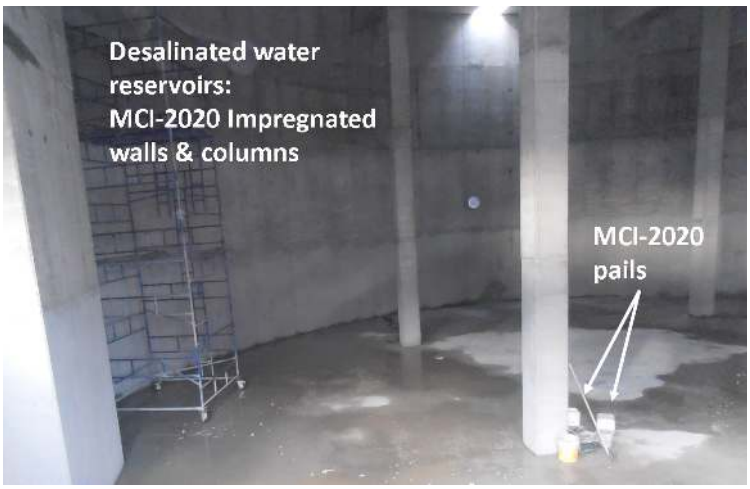
MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

Case Histories

Sorek Desalination Plant

Longevity was a major concern when the world's largest reverse-osmosis desalination plant was constructed in Israel in 2010-2013 to process seawater into drinking water. Because of the aggressive situation, MCI®-2005 corrosion inhibiting admixture and Xypex* C-1000 NF crystalline waterproofing admixture were admixed into concrete used to make the prefabricated concrete jack-pipe segments and the ready-mix concrete for the sand filtration bins. Brine reservoirs were also poured with concrete containing MCI®-2005. MCI®-2020 was surface applied to structures such as desalinated water reservoirs and columns in less aggressive environments where MCI®-2005 had not been used and there was insufficient rebar coverage due to application errors. As of seven years from application, there had been no apparent corrosion or other concrete related issues.

Read more: https://www.corteccasehistories.com/?s2member_file_download=access-s2member-level1/ch594.pdf



Rotana Resort

A prestigious five-star resort of 354 rooms and 13 villas in Abu Dhabi was located very close to the sea where there is an elevated risk of steel reinforcement corrosion due to high salinity levels in the groundwater table. MCI®-2005 met the requirements of the design engineering firm and was therefore incorporated into more than 18,000 cubic meters (635,664 ft^3) of concrete in the substructure to enhance durability and maximize service life of the resort structures.

Read more: https://www.corteccasehistories.com/?s2member_file_download=access-s2member-level1/ch576.pdf

*Xypex is a registered trademark of Xypex Chemical Corporation.

MIGRATING CORROSION INHIBITORS
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Product Highlights

CorrVerter® MCI® Rust Primer

CorrVerter® MCI® Rust Primer offers engineers, owners, contractors, DOTs, and other government agencies a convenient, low-labor option when performing repairs on heavily corroded rebar and other metal surfaces. This single component, fast drying, water-based primer is formulated to penetrate and eliminate rust as well as to protect bare metal against further rusting. CorrVerter® MCI® Rust Primer converts existing rust to a passive layer and can be used alone or with a topcoat for extended protection. With CorrVerter®, surface prep is simplified, only requiring workers to remove loose rust with a wire brush, wash the surface to remove contaminating salt and dust, and then brush CorrVerter® onto the dry or damp metal surfaces.

Read more: https://www.cortecvci.com/whats_new/announcements/CorrVerter-MCI-Rust-Primer.pdf

Upcoming Events

European Sales & Strategy Meeting
October 11th-12th
Zagreb and Beli Manastir, Croatia

ACI (American Concrete Institute) Fall Convention
"Dream Big, Build Bigger"
October 14th-18th
Rio All-Suites Hotel
Las Vegas, NV
https://www.concrete.org/events/conventions/futureconventions.aspx

Latin American Sales Meeting
October 26th-27th
Buenos Aires, Argentina

2018 ICRI Fall Convention
"Resiliency: Above and Beyond Concrete Restoration"
November 7th-9th, 2018
Omaha Marriott Downtown at the Capitol District
Omaha, Nebraska
https://www.icri.org/page/conven_fall2018_home

Asia-Pacific Sales & Strategy Meeting
November 7th-10th
Shanghai, China

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