



MIGRATING CORROSION INHIBITORS  
FROM GREY TO GREEN

June, 2015

# NEWSLETTER

## 60 Minutes Missed One Important Solution to Infrastructure Woes, Corrosion Control

NACE International, the technical society for corrosion professionals worldwide, issued the following statement:

Sunday night's "60 Minutes" segment on the dangerous state of America's infrastructure represents yet another urgent call for the public and private sectors to address this growing risk to public safety. Although decision makers recognize the problem and the need for solutions, appropriate funding for critical infrastructure repair has not been put in place.

There are 70,000 structurally-deficient U.S. bridges; most are still in use well past their design life, and more than 15 percent are at risk of catastrophic, corrosion-related failure. The staggering cost of necessary repairs makes headlines, but what's forgotten is that corrosion-control technology and effective management practices can extend the life of bridges and other infrastructure well beyond original design life. When employed during initial construction, corrosion control can produce low-maintenance bridges with service lives up to 100 years – 50 years longer than the crumbling bridges we drive on today.

There is a cost to implementing corrosion control, but it has demonstrated a return on investment that outweighs the expense. Corrosion control ensures maximized asset life, increased public safety, reliable performance, environmental protection and more cost-effective operations.

At NACE International, we are developing a study to show specific costs of corrosion control for old and new assets. Our members are working with policy makers in Congress and state and local governments on policies that eliminate the devastating effects of corrosion. It is up to experts and member-driven associations like NACE International to provide decision makers with solutions and options to guide them to informed decisions that strengthen public safety, reduce long-term costs, and stimulate America's economy.

We have the technological means to sustain our infrastructure safely into the next century; now it is time to find the fiscal solutions to do the same. For more information on NACE International resources on Highway and Bridge Corrosion, visit [www.nace.org](http://www.nace.org) - See more at: <http://www.nace.org/60-minutes-missed-important-solution-to-infrastructure-woes-corrosion-control.aspx#sthash.0sGBbC3Y.dpuf>

## MN ICRI 2015 Spring Tech Session:

Jessi Meyer, Cortec's Vice President of Sales – Asia/MCI®/Additives, and Adam Bakeman, Engineering Technician III at American Engineering and Testing, presented at the MN Chapter ICRI Spring Technical Session. The event was held on May 19, 2015 at American Engineer Testing Inc., St. Paul, MN. The topic was Corrosion of Reinforcing Steel, A Look at Corrosion Inhibitors and Non-Destructive Testing.

The seminar started with an overview of the corrosion process and non-destructive testing methods. Adam then highlighted the use of the Half-cell testing which is useful for measuring corrosion potential. Jessi then discussed Linear Polarization which can calculate actual corrosion rates of embedded reinforcing steel and is usually the preferred method of testing when a corrosion inhibitor has been used. The seminar concluded with three case studies, including the Pentagon, exhibiting the use of corrosion inhibitors and non-destructive testing.







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## Case History

### Crosley Tower Renovation

Crosley Tower, built in 1969, was one of a series of high-rise buildings erected on the University of Cincinnati campus in that era. Restoration of this tower was done in the fall of 2010. Due to the low cover of concrete over the rebar, corrosion was evident including spalling concrete and exposed bar. MCI®-2020 or MCI®-2020 V/O was specified in order to address the corrosion issue.

A mock-up was done with both versions of MCI®. Due to the porosity of the concrete, it was determined that MCI®-2020 would be appropriate. MCI®-2020 was applied and after 45 days, 2" cores were pulled for testing and analysis of penetration. QAC (Quaternary ammonium compound testing was done by Cortec's ISO/IEC 17025 certified lab. The results of the QAC test indicated MCI® present in all samples. Migration to the steel on that specific structure was a depth within 2.5 inches.

The project was a success due to the Engineering specification of appropriate patch repair, a migratory corrosion inhibitor and an elastomeric coating (LOXON XP - Sherwin Williams). Other materials needed for this restoration were also specified in order to complete appropriate repair. The benefit of MCI®-2020's lack of damage to substrates including glass, vegetation and automotive finish was also appreciated by the University. The lack of having to mask the windows and the risk of over spray on such a large structure was also appreciated by the contractor and was a definite consideration in choosing MCI®.

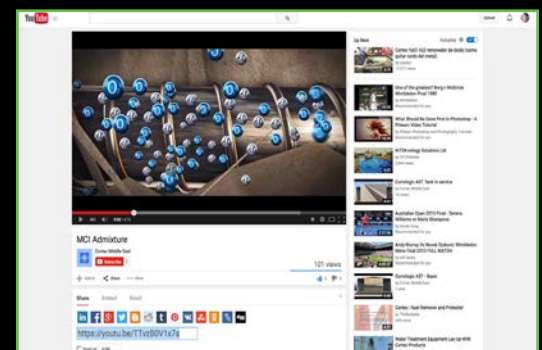


## On The Web

### New MCI® Admixture Animation Video Available

Cortec® Corporation's patented MCI® (Migrating Corrosion Inhibitor) technology is explained through a dynamic animation that is now available online. This video shows how MCI® technology protects reinforcing metal in concrete from corrosion.

The animation demonstrates how MCI® greatly extends the service life of new structures by proactively delaying the onset of corrosion, and keeping rates low after initiation. In rehabilitation projects, MCI® applications can penetrate a considerable distance to significantly reduce the corrosion rate (up to 80%). Cortec® MCI® products maintain structural integrity, rehabilitate vulnerable structures, and alleviate environmental concerns. To learn more about MCI® products, view the video at: <https://www.youtube.com/watch?v=TTvzB0V1x7s> or <https://www.linkedin.com/company/mci-migrating-corrosion-inhibitors->



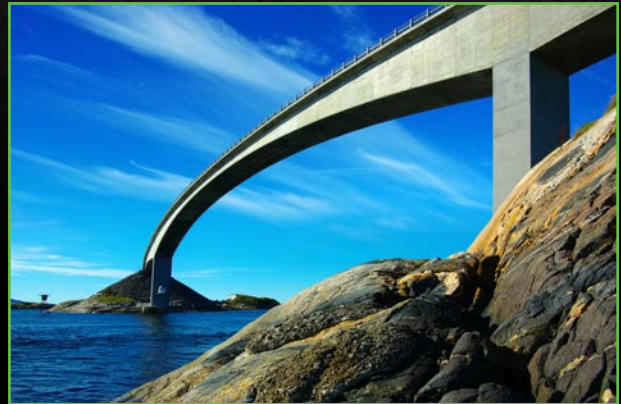


## Featured Product

### MCI®-2020 - Organic Corrosion Inhibitor

MCI® 2020 is an organic, surface applied, migrating corrosion inhibitor designed to penetrate through cementitious materials including concrete, mortar, and limestone. It migrates in both liquid and vapor (gas) phases through the pore structure, forming a protective, molecular layer on embedded reinforcement and allowing vapor diffusion. MCI® 2020 provides strong corrosion protection against carbonation, chlorides, and other contaminants and will migrate independent of orientation (horizontal, vertical or overhead up to 8 cm (3 inches) in 30 days).

Water based, non-flammable MCI® 2020 offers engineers, owners, contractors, DOTs, and other government agencies a time proven, corrosion inhibiting technology that will significantly extend the service life of their reinforced concrete structures. MCI®-2020 can be applied to new concrete or used for rehabilitation and will not delay construction or increase costs. Unlike standard inorganic inhibitors it does not have to come in contact with the reinforcing steel upon application. MCI®-2020 is considered ambiodic (mixed) which means it protects both anodic and cathodic areas within a corrosion cell. It contains 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.



MCI®-2020 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, atmospheric attack), parking garages, concrete piers, dams, offshore platforms, piles, pillars, pipes, utility poles, cooling towers and concrete potable water structures. It is also an important component of Cortec's High Performance Repair System™ (HPRS®).

MCI®-2020 is easily applied by spray, brush, or roller and does not etch, stain, discolor, or otherwise harm glass, metals, or automotive paint. It does not contain calcium nitrite or wax and no removal of sound concrete is required. Its excellent performance is proven in both lab and field testing. MCI®-2020 conforms to ASTM G 109, ASTM E 96, meets ANSI/NSF Standard 61 Approval for structures containing potable water and is RoHS compliant.



MCI®-2020 was chosen for renovation of Pentagon and has won International Concrete Repair Institute Award for the best repair project.

Corrosion of embedded reinforcing steel was causing spalling on the walls of the Pentagon. Carbonation 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 18600 m2 (200,000 ft2) of surface hand patch repair and over 92903 m2 (1,000,000 ft2) 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. MCI®-2020 enabled the Pentagon building premium repair, rehabilitation, and protection for the next 50 years.



# Upcoming Events



**NACE Concrete Service Life Extension Conference**  
Philadelphia, PA  
June 30-July 1, 2015



**MN Chapter of ICRI Golf Outing**  
Edinburgh Golf Course, MN  
July 21, 2015



**MCC Golf Outing**  
Mendakota Country Club, MN  
August 24, 2015



**Cortec® World Sales Meeting**  
St. Paul, MN  
September 16-18, 2015



**MN ICRI Fall Technical Session**  
Eagan, MN  
October 8, 2015



**ICRI Fall Convention**  
Ft. Worth, TX  
October 14-16, 2015



**ACI Fall Convention**  
Denver, CO  
November 8-12, 2015

[www.cortecmci.com](http://www.cortecmci.com)

[www.cortecvci.com](http://www.cortecvci.com)



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