



Corrosion-Inhibiting Powder Protects Bridge Cables During Construction



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The St. Croix Crossing, dedicated August 2, 2017, is a significant new structure connecting Oak Park Heights, Minnesota, with St. Joseph, Wisconsin. The new bridge is expected to promote regional economic development and reduce congestion by replacing the historic but aging Stillwater Lift Bridge (destined for pedestrian traffic) with an engineering masterpiece. The new St. Croix Crossing is designed to carry tens of thousands of vehicles in uninhibited travel across the St. Croix National Scenic Riverway every day.

Because of its unique environment, the approximately one mile long crossing was specially designed as an extra dosed bridge (combination box girder and cable stay bridge) to minimize the environmental and visual impact of the structure on the St. Croix River Valley. As one of only two of its kind in the United States, it is a model of engineering and design ingenuity. Cable stays support the bridge at five pier locations in the river, while approximately 1,000 pre-cast boxlike segments are connected by post-tensioning (PT) cables that are tensioned and grouted in place. PT was also used in the crossbeams connecting upstream and downstream towers at each of the five pier sites.

An unseen but important part of construction was protecting the PT tendons from corrosion before grouting. Grouting is commonly delayed several weeks or months on long-term projects or when extremely cold winter temperatures interrupt continuous grouting. State and federal requirements typically call for corrosion inhibitor application if the waiting period is two weeks or longer.

The Lunda/Ames Joint Venture, a major partner in the multiyear construction of the St. Croix Crossing, chose to extensively apply an easy-to-use, low-toxicity corrosion inhibitor to protect various post-tension strands placed throughout the bridge during construction. MCI®-309 is a corrosion inhibiting powder produced as part of a line of Migrating Corrosion Inhibitor™ concrete protection products

from Cortec® Corporation in White Bear Township, Minnesota, not far from the new St. Croix Crossing. It has been used to protect PT strands in many important bridge projects across the country, including the Wakota Bridge in nearby Saint Paul, Minnesota.

MCI-309 can be easily fogged through post-tension ducts using a low-pressure air hose after PT strands are placed in the duct. The powder vaporizes and adsorbs on metal surfaces, forming a protective molecular layer on the tendons. The layer helps reduce corrosion by inhibiting interaction with corrosive elements such as air, moisture, and chlorides. As a mixed inhibitor, MCI-309 discourages both cathodic and anodic corrosion reactions from taking place on the tendons. Little or no surface preparation is required before application, and the MCI-309 does not need to be flushed out before grouting, reducing labor. MCI-309 can provide up to 24 months of continuous protection.

The St. Croix Crossing is an important economic connection for the two Midwestern U.S. states of Minnesota and Wisconsin, allowing unobstructed commerce and travel for thousands of commuters and vehicles each day. It also symbolizes ingenuity, not only in its design for low environmental and visual impact, but also in the important details of preserving integral post-tension strands with Cortec MCI-309 during construction.

To find out more about the MCI product line, visit <http://www.cortecmci.com/>

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