



# CATHODIC PROTECTION RECOMMENDED TO PROTECT GLASS-FUSED-TO-STEEL WATER TANKS

Cathodic protection (CP) is a technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell. A simple method of protection connects the metal to be protected (cathode) to a more easily corroded "sacrificial metal" to act as the anode. Both have to be in an electrolyte such as water or soil.

Cathodic protection does not actually eliminate corrosion. Instead, it transfers it from the structure to be protected to the cathodic protection anodes. The structure is now the cathode of an intentional corrosion cell. Corrosion of the metal will cease once the applied cathodic protection current equals or exceeds the corrosion current.

## GLASS COATED TANKS AND PASSIVE CP SYSTEMS

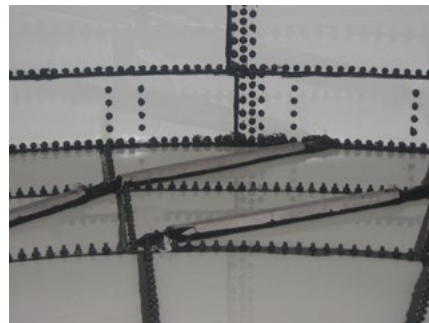
One of the advantages of porcelain enamel is its very strong adhesion and bonding to the steel substrate. Because of this, Greatario Engineered Storage Systems recommends and sells passive CP systems for all of their glass-fused-to-steel tanks storing water. The CP design has been developed and refined over 30 years to ensure maximum tank longevity and coating compatibility, which results in minimal life cycle costing for the tank.

CP protects storage tanks, the environment, and the bottom line of owners and operators. It must be an integral part of a storage tank owner/operator's long-term planning. This includes ongoing education and training for persons responsible for operating tank systems. These individuals must be able to recognize the early signs of deterioration and prevent it effectively.

Owners and operators must also dedicate the resources required to monitor and maintain these cathodic protection systems to ensure effective protection of their tank. An asset management plan developed by Greatario should be followed by the tank operator and



(Left) Greatario installed its first permanent glass coated tank in Midhurst in 1986. (Top right) Anodes installed on the glass fused to steel floor can be tested from the outside of the tank using a multi-meter +CSE per NACE requirements, while the tank is in service (bottom right).



include scheduled tank inspections and anode testing.

## GREATARIO'S NACE CERTIFIED TECHNICIANS

"Greatario has committed itself to assisting water operators extend the life of their tanks as long as possible. Our National Association of Corrosion Engineers (NACE) certified technicians have the ability to work with tank owners and provide cathodic protection testing and recommendations," comments president Scott Burn.

"Our technicians have the theoretical and practical fundamentals for testing, evaluating, and designing both galvanic and impressed current cathodic protec-

tion systems," he added.

According to Scott Plant, Greatario's service manager and NACE certified cathodic protection tester: "Passive/galvanic cathodic protection systems (i.e., sacrificial anodes) most commonly used in our tanks are in place to absorb the corrosive energies inside the tank. This results in corrosion occurring at the anode (less noble metal) as opposed to the tank (more noble metal)."

He added that, "although our tanks have a permanent glass coating, CP is in place as added protection should any part of the coating become compromised due to unforeseen circumstances. Like any piece of equipment, every CP system requires periodic testing to ensure the

tank is adequately protected.”

Greatario's first permanent glass coated tank, built in Midhurst, Ontario, in 1986, did not have a cathodic protection system installed, which was considered normal at the time. Although the tank continues to operate efficiently and provide safe clean water to the community, the addition of eight magnesium anodes will extend the life of the tank for many more years.

Midhurst is one of 13 tanks which have been built for Springwater Township. “We have worked with the water operators and have installed cathodic protection to all but two of the tanks,” Plant comments.

Richard Eagle, of the Ontario Clean Water Agency, oversees the water system for Springwater Township. “Other than the addition of cathodic protection to these tanks, only minimal maintenance has been done. The tanks at Hillsdale and Anten Mills require CP to be added, which is scheduled to be done this year,”

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Eagle comments.

“Greatario has set up an asset management schedule for us. This ensures interior and exterior tank inspections and anode testing are completed on a timely basis. You would never guess that the initial tanks in Springwater Township are 30 years old. Tank cleaning makes these tanks look like the day they were built,” Eagle states.

Aquastore tanks have a low life cycle cost largely because they do not require

painting. Average costs associated with painting can be about \$300.00 per square metre. Not only is this a significant operating cost to be incurred, the down time of the tank is very inconvenient. “Typically, repainting a tank has to be done in the peak of the summer and you need to plan for a lengthy down time,” Plant comments. ■

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