

Corrosion of the Infrastructure

Many infrastructure facilities are deteriorating and literally crumbling. One major cause is inattention to corrosion control as part of an overall maintenance program. Corrosion most often affects metal structures, such as bridges, steel-reinforced concrete, and pipelines. Corrosion damage is not always visible to the public, but nevertheless can lead to structural failure, loss of life, loss of capital investment, and environmental damage. The responsibility for preserving and maintaining these aging facilities, some of which are in a state of accelerating decay, rests with both the private and public sectors.

How Do We Control Corrosion?

Four common methods used to control corrosion of infrastructure facilities are protective coatings and linings, cathodic protection, corrosion-resistant materials, and inhibitors.

Coatings and linings are principal tools for defending against corrosion. They are often applied in conjunction with cathodic protection systems to provide the most cost-effective protection for the structure.

Cathodic protection (CP) is a technology that uses direct electrical current to counteract the normal external corrosion of a structure that contains metal, such as a pipeline or a concrete bridge with steel reinforcing components. On new structures, CP can help prevent corrosion from starting; on existing structures; CP can help stop existing corrosion from getting worse.

Corrosion-resistant materials such as stainless steels, plastics, and special alloys can often be used with little or no supplemental corrosion protection. When selecting corrosion-resistant materials for a particular application, the designer must consider the desired life span of the structure as well as the environment in which it will exist.

Corrosion inhibitors are substances which, when added to a particular environment, decrease the rate of attack of that environment on a material such as metal. They can help extend the life of equipment, prevent system shutdowns and failures, avoid product contamination, prevent loss of heat transfer, and preserve the appearance of a structure.

Evaluating the environment in which a structure is or will be located is very important to corrosion control, no matter which method or combination of methods is used. Modifying the environment immediately surrounding a structure, such as reducing moisture or improving drainage, can be a simple and cost-effective way to reduce the potential for corrosion.

What is the Solution?

Whether considering public safety or environmental protection, countries cannot afford to allow their infrastructure facilities to deteriorate. Corrosion is not a mystery—we know how to control and predict it. Using state-of-the-art proven corrosion control technology designed and applied by qualified corrosion control professionals, we have the ability to address the decay of infrastructure facilities and to extend the life span of those structures for the next generation and beyond.

Attention to corrosion in the design, material selection, construction, operation, and maintenance of infrastructure facilities will save billions of dollars in repair, maintenance, and replacement costs. Controlling corrosion in the infrastructure can prevent premature failure and lengthen useful service life, both of which save money and natural resources, promote public safety, and protect the environment.