

Corrosion Control and Environmental Protection

Corrosion can cause numerous environmental problems. For instance, water systems can become contaminated and unsuitable for transporting drinking water as a result of corrosion. Also, structures such as storage tanks, pipelines, ships, railcars, tanker trucks, and nuclear waste facilities—all of which store and/or transport potentially hazardous materials—can be highly subject to the harmful effects of corrosion. When the structural integrity of these facilities is weakened by corrosion, the environment and public safety are threatened.

How Do We Control Corrosion?

There are four common methods used to control corrosion. They include protective coatings and linings, cathodic protection, materials selection, and corrosion inhibitors.

- *Coatings and linings* are principal tools for defending against corrosion. These substances are often applied in conjunction with cathodic protection systems to provide the most cost-effective protection for a 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 an underground petroleum storage tank or natural gas pipeline. On new structures, CP can help prevent corrosion from starting; on existing structures, CP can help stop existing corrosion from getting worse.

- *Materials selection* refers to the selection and use of corrosion-resistant materials such as stainless steels, plastics, and special alloys to enhance the life span of a structure. Some of the most common materials used in constructing a variety of facilities, such as steel and steel-reinforced concrete, can be severely affected by corrosion.

- *Corrosion inhibitors* are substances that, 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 an attractive appearance of structures.

Evaluating the environment in which a structure is or will be located is very important to corrosion control, no matter which control 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 effective way to reduce the potential for corrosion.

What Is the Solution?

The basic purpose of corrosion control is to maintain the soundness and integrity of a structure. If a structure is free of corrosion, the risk of harmful leakage or an explosion is significantly reduced. Corrosion control offers proven, cost effective ways to reduce the premature deterioration of materials and protect both the public and the environment in the process. An important component of this process is using trained professionals equipped with the latest technologies. Another equally important aspect of controlling corrosion is recognizing that corrosion is indeed a threat and taking the steps to prevent it. Implementation of effective corrosion control programs will result in a safer, cleaner environment, and a safer, healthier public.