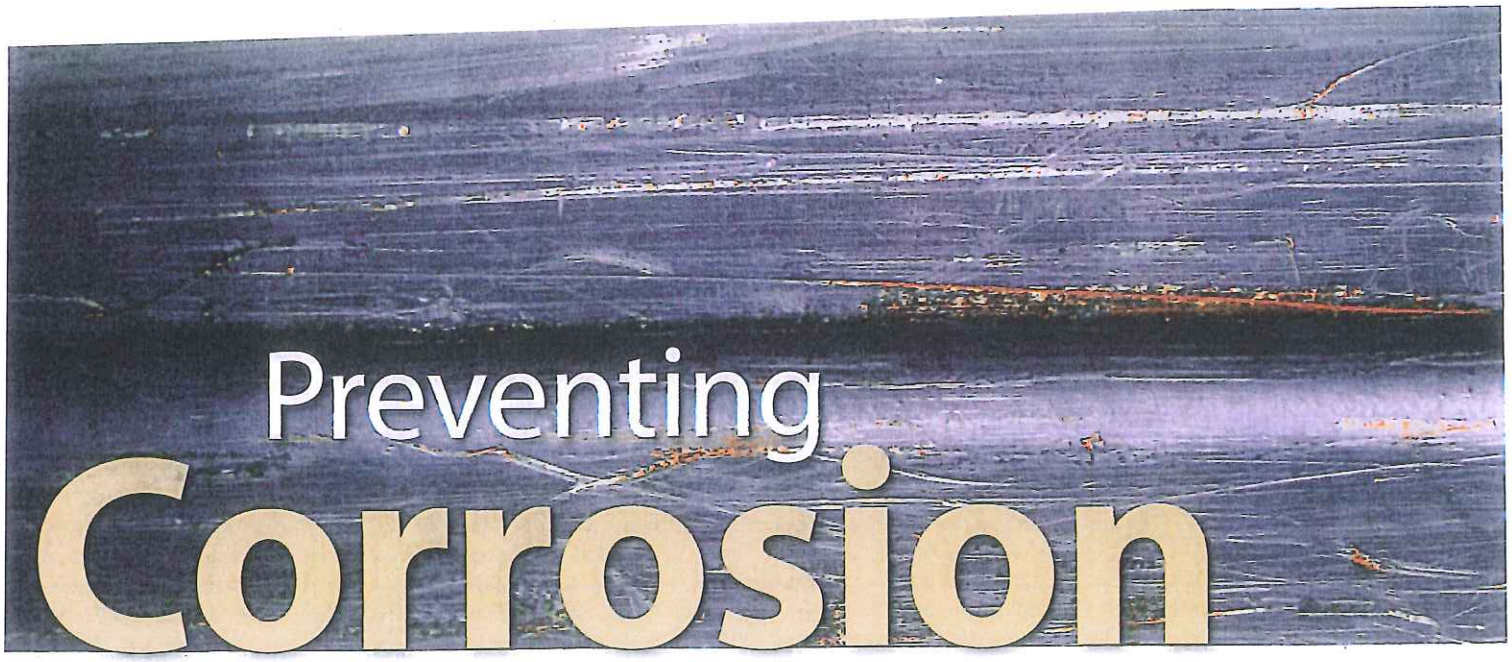


Preventing Corrosion

When it comes to the protection of steel from corrosion there are three ways this can be achieved. Slowing down the corrosion process can be done through either barrier protection, galvanic effect or inhibition effect. Each one of these methods have had success in their own right. Most protective coatings provide one and sometimes two of these methods in a single coating. There are ways to combine the three methods into a single technology. Extreme heat and cold, UV rays, salt and sand create a daily assault on bridges, buildings and outdoor structures, leading to corrosion of unprotected structures.

CFCM spoke to manufacturers of anti-corrosion products used in the manufacture of paint and coatings for a sampling of their latest or most popular anti-corrosion additives.

AGC Chemicals Americas, Inc., is the developer of LUMIFLON fluoroethylene vinyl ether (FEVE) resin, a solvent-soluble fluoropolymer. LUMIFLON imparts superior corrosion resistance when formulated into coatings, sealants and paints.

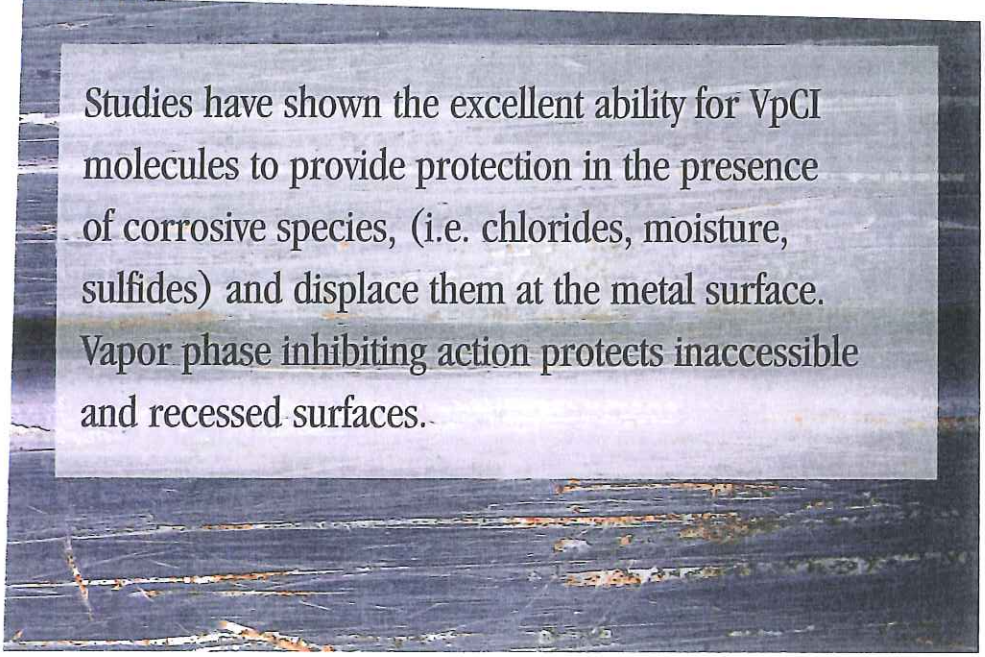
Traditional fluoropolymers provide excellent characteristics to improve weathering and corrosion resistance. However, these products must be heated to temperatures greater than 200 °C to cure, making field application extremely difficult. FEVE resins do not require heating to cure, allowing the flexibility for both field or factory applications. FEVE resins retain positive characteristics of traditional fluoropolymers, imparting excellent resistance to corrosion, dirt, UV rays, wind, rain and chemicals.

Since AGC introduced LUMIFLON in 1982, it has been used extensively in coatings for a variety of industries, including marine, aerospace, automotive, architecture and transportation. AGC offers LUMIFLON in both solvent-based and water-based polymers, including a solid flake resin. This allows the formulation of coatings with no or low volatile organic compounds (VOC) and no hazardous air pollutants (HAP).

LUMIFLON is transparent, provides excellent adhesion to primers, fiberglass, plastics, composites and metals including aluminum and steel, and can be used in both clear and pigmented coatings. The product currently has a wide variety of uses, including coatings for bridges, boats, water tanks and buildings, and coil coatings for commercial construction.

AGC Chemicals Americas, Inc., is a wholly owned subsidiary of Asahi Glass Co., Ltd., a $13 billion multinational corporation and one of the world's largest manufacturers of glass, electronic displays and chemical products. The company was formed in 2004 through the merging of sister companies Asahi Glass Fluoropolymers USA and AGA Chemicals. Headquartered in Exton, Pa., AGC Chemicals Americas maintains manufacturing operations in nearby Thorndale, Pa., and warehouses located throughout North America.
www.agcchem.com

Heavy duty coatings – the toughest industrial coatings require robust support. BYK additives boost the performance of all anti-corrosion coatings by improving specific aspects of their functionality. They are also highly practical and suitable for a wide range of applications because, depending on requirements, they can increase color brilliance, vary a coating's hardness or elasticity, or generally improve protective properties of the coating against environmental damage or abrasion. This makes them an essential component for all types of protective coatings designed to protect high value investments from the demands of daily use. Whether these are onshore or offshore applications, BYK either already has the solution you need or has the expertise and technology to develop it. BYK has developed specific additives for heavy duty coatings. These additives can be used in a range of applications, including primers, intermediate coats and topcoats. BYK has solutions for a variety of resin systems like alkyds, acrylics and epoxies, polyurethanes, silicones, siloxanes and fluoropolymers. Solvent-borne, solvent-free



or water-based, and for every area of application.

Nano technology has also been used in anti-corrosion. Cortec Corporation, a world leader in innovative, green, sustainable technologies offers the latest advancement in environmentally safe corrosion protection - BioPouch. This is not something formulated into the paint. This brand new, revolutionary "green" Vapor phase Corrosion Inhibitor (VpCI) is aimed for protection of metal parts in a non-ventilating space. BioPouch is powered by newest NANO-VpCI technology, primarily made from agricultural by-products. NANO-VpCI's emit from the pouch and saturate the enclosure via diffusion, filling all void spaces and recessed areas with protective vapor molecules. These molecules are attracted to and adsorb onto metallic surfaces, resulting in the formation of a nano protective barrier layer.

Studies have shown the excellent ability for VpCI molecules to provide protection in the presence of corrosive species, (i.e. chlorides, moisture, sulfides) and displace them at the metal surface. Vapor phase inhibiting action protects inaccessible and recessed surfaces. BioPouch is nontoxic, free of nitrites, halogens and phosphates as well as completely safe to handle.

BioPouch provides an extremely efficient and easy method to protect metals within an enclosed space. In case a nano protective layer is disturbed by moisture or opening of an enclosed space, the layer is replenished by continuous vapor re-deposition.

The Nano-VpCI is made from enhanced renewable agricultural by-products and does not destroy the natural balance of the environment while being functionally superior to hazardous oil derived products. It is very effective in polluted and humid environments.

BioPouch is quick and super easy to use: there is no need for special equipment for application, just determine the number of pouches required per unit space. No spraying, wiping or dipping is required. Each BioPouch protects up to 1m3 of enclosed space.

www.cortecvci.com

For over 40 years, HALOX has been providing the paint and coatings industry with its innovative corrosion inhibiting product line. In 2011, HALOX® was acquired by ICL\ Performance Products, one of ICL's (Israel Chemicals Limited) core operating segments. HALOX is now a product brand name under ICL\ Advanced Additives, one of several business segments operated by ICL/ Performance Products. As a global leader in providing corrosion inhibitors to the paint and coatings market,

ICL\ Advanced Additives is an innovative solution provider for ever-evolving needs. HALOX Corrosion Inhibitors offer safer, more durable and longer-lasting solutions to address a multitude of coating needs.

For Powder Coatings HALOX offers:

- HALOX 430, a patented calcium phosphate and ion exchange technology. It is also the newest generation heavy metal-free corrosion inhibitor. This product was designed to offset zinc, molybdenum, chromium and barium-based corrosion inhibitors.
- HALOX 430 JM is designed for long-term corrosion protection and is suitable for clear coat systems. The jet-milled feature offers significant advantages for thin film applications (<10 microns). It is easy to disperse and provides cleaner grinds for improved corrosion inhibition efficiency. It is a moderate solubility corrosion inhibitor and hexavalent chromate replacement option for galvanized, Galvalume, and aluminum alloys.
- HALOX 650 is an organic corrosion inhibitor designed primarily for coatings and primers on metal surfaces. It is specifically designed for solvent-based or powder coating applications to provide long-term corrosion protection.
- HALOX Z-PLEX 250 is a universal inorganic corrosion inhibitor designed for water-based, solvent-based, and powder coatings. It exhibits a high degree of versatility because of its neutral pH and narrow particle size distribution with a top end below 20 microns.

This is just a sampling of the anti corrosion additive products that Halox as avaible. Besides powder coating, the company also offers products for Aerosol, Aetospa e, Agricultural and Construction Equipment, Architectural, Aut0omotive Refinish, Coil Coatings, Industrial Maintenance, Marine Pretreatment/Sealers for both wood and metal.

www.halox.com

Research is ongoing for the best performing anti-corrosion additives in the manufacturing of paint and coatings.