

CERIUM-BASED CORROSION INHIBITION ADDITIVE



A NONTOXIC ALTERNATIVE FOR CORROSION INHIBITION

Battelle's cerium-based corrosion inhibition additive provides a functional, ready-to-deploy addition to coating platforms that has been proven to improve the resistance to corrosion over non-additive topcoats. In addition, it is:

- A nontoxic alternative to chemical inhibitors and hexavalent chromium
- Adaptable for a broad range of applications
- Ready for scale up and integration

OUR TECHNOLOGY

Battelle's additive takes advantage of the inherent oxidation-reduction capability of the mixed oxide, CeO_2/Ce_2O_3 , that forms. Similar to the mechanism at work with chromate corrosion protection, the ceria mixed oxide redox vacillation provides a renewable source of electrons to a corroding metal surface thus passivating the anodic dissolution of the substrate material.

HOW WE DIFFER

Our additive delivers a nontoxic alternative to other corrosion inhibition technologies. The sulfonated sulfone platform provides performance characteristics improvements over other polymeric coating technologies.

- Cerium's oxidation/reduction capability provides an ecologically friendly alternative to chromate corrosion inhibition.
- Potential elimination of chromate and chromate conversion coatings from industry assuages long-term health effects.
- Sulfonated sulfone backbone has excellent hydraulic and temperature stability, resistance to UV degradation.
- The sulfonated sulfone's temperature stability allows for use in powder-coating systems where many corrosion inhibitors are exhausted by the increased temperature application.

CURRENT USE

This technology has been demonstrated to provide increased corrosion resistance when added to urethane topcoats on steel and aluminum substrates. It's currently in a development phase and has yet to be fully scaled for commercial system integration.

FUTURE USES

There are many potential applications for Battelle's Ce-based inhibitor. Incorporable as an additive or working into formulations, our development team can work with you to custom engineer a solution for your application and get you to market quickly.

- Corrosion prevention in marine applications/ maritime vehicles
- Automotive and aerospace applications
- Corrosion and UV degradation mitigation in architectural features
- Protection of energy infrastructure
- General application for increased corrosion inhibition in any coated metal system or subsystem
- Water-based, oil-based and powder-coat systems

Every day, the people of Battelle apply science and technology to solving what matters most. At major technology centers and national laboratories around the world, Battelle conducts research and development, designs and manufactures products, and delivers critical services for government and commercial customers. Headquartered in Columbus, Ohio since its founding in 1929, Battelle serves the national security, health and life sciences, and energy and environmental industries. For more information, visit www.battelle.org.

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