



Total Chromium-free Primer Coating For Corrosion Protection

Technology Case: RFT-0140

Invention Summary

Since the early 1980's, the use of chromates and other chromium-containing compounds have been subject to stringent regulations due to their recognized carcinogenic properties.

In an attempt to find a substitute for widely used chromium-based primer coating products, scientists at North Dakota State University have invented a novel, chrome-free primer coating with proven anti-corrosive properties on metal substrates. The use of this primer eliminates risks associated with handling toxic and carcinogenic chromium metallic compounds, and alleviates waste disposal hazards.

This invention has been proven to be the only technology that protects high strength Aluminum alloys from corrosion, without the need of any chromate pretreatment or pigmentation.

Benefits

- Provides extended corrosion protection to metal substrates surfaces (e.g. Aluminum alloys)
- Supports non-hazardous manufacturing and operation practices
- Possesses easy mixing and spraying properties
- Compatible with most conventional equipment and environmentally acceptable solvents and pre-treatments
- Complies with European Union and US Department of Labor - OSHA regulations
- Does not require any chromate based surface pretreatment, compatible with commercially available Cr-free surface treatments

Invention Premise

This invention is based on the premise that the presence of Mg granulate in the coating will provide sacrificial protection to the underlying metal substrate. This type of primer outlasted many commercial products in salt fog exposure.

The protective ability of this primer has been studied via multiple electrochemical techniques (EIS, ENM, PDS) and characterization methods (SEM).

Available Variants of the Primer

- **Glass-like surfaces:** UV curable version suitable for glass-like surfaces or where quicker drying is needed
- **Frequent repainting:** Organic version where maintenance operations merit frequent repainting
- **Harder Coatings:** Inorganic version suitable for harder coatings

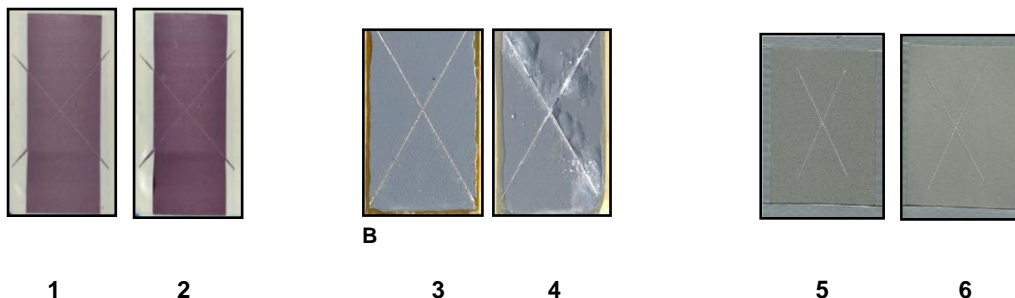


Figure: Pictures of primed metal panels exposed to ASTM B-117 salt fog chamber.

- (1) UV curable Mg rich primer at 0 hours of exposure (2) 1511H of exposure
(3) NDSU technology at 4,800hrs, and (4) conventional technology at 1,800 hrs
(5) Inorganic Mg rich primer at 0 hours of exposure (6) 300 hours of exposure

Patents

A PCT Patent application is pending. National phase patent applications have been filed in the United States, Canada and Europe and these patent rights are available for licensing/partnering opportunities.

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