



Corrosion Inhibitor Performance Comparison

Aerospace Soft Coatings Assessment

Introduction

Comparison of soft coating corrosion inhibitors commonly used in the aerospace industry was carried out. The relative performance of XCP™ Rust Blocker versus that of LPS Laboratories' LPS3 Rust Inhibitor, Lear Chemicals' ACF50, Zip-chem Cor-ban 23 and US Corrosion Technologies' Corrosion X was required. Mild steel Q-Lab S-36 plates were used as the metal test substrate.

Procedure

The mild steel test plates were treated with the products under evaluation, placed in a controlled-environment corrosion chamber and subjected to a constant aspirated spray of 5% salt solution. The test protocol used is as described in the recognised industry standard methodology for this type of assessment, ASTM B117.

The test plates were initially cleaned with isopropanol and acetone and then dried thoroughly. They were sprayed in order that an excess of product was applied to each panel and left to stand for 16 hours at room temperature before being placed in the test chamber. A periodic visual and photographic assessment of the progression of the corrosion on each of the pieces was carried out over the test period.

Results

The photographs below show the progression of the corrosion on the treated mild steel panels. Time intervals indicate total test period in the corrosion chamber.

ACF50



24 Hours



48 Hours

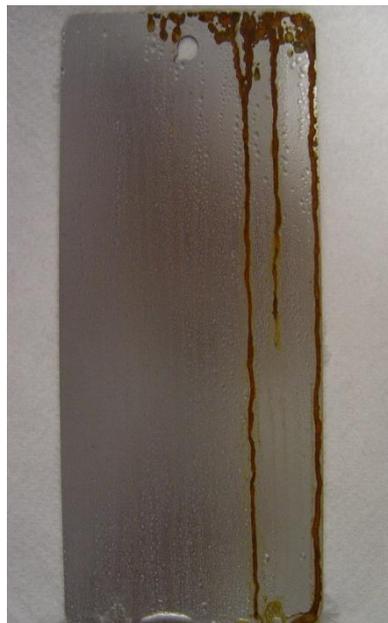


120 Hours

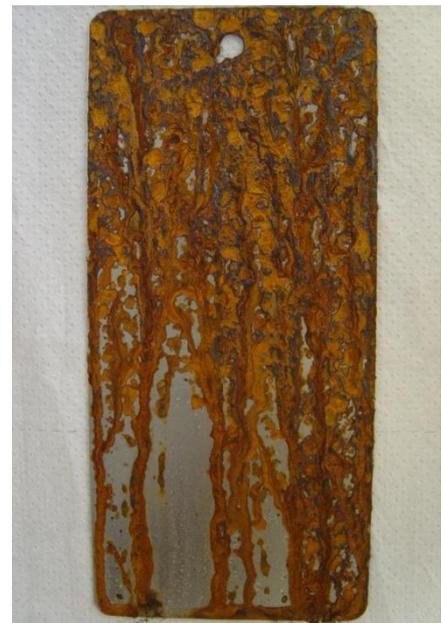
Corrosion X



24 Hours



48 Hours



120 Hours

Results (cont.)

Cor-ban 23



24 Hours



48 Hours



144 Hours

Results (cont.)

LPS3



24 Hours



48 Hours



120 Hours



336 Hours



432 Hours

It was noted that the LPS3 coating is immobile on application – it does not spread over the treated surface when sprayed. This necessitates the application of a considerable amount of product to cover the required surface area and results in an uneven film.

The product also carries a considerable amount of entrained propellant gas when sprayed – this results in numerous air bubbles being present in the applied coating and therefore large areas where there is significant inconsistency in the film thickness.

Results (cont.)

XCPT™ Rust Blocker



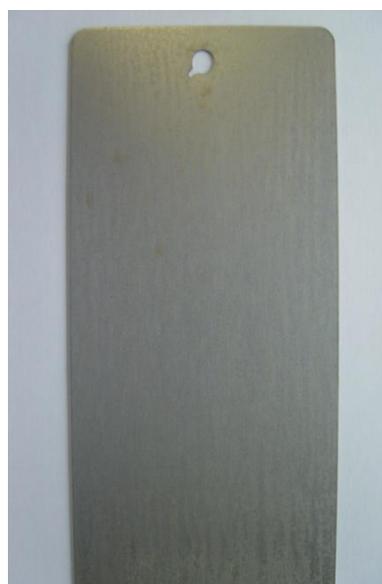
24 Hours

48 Hours

120 Hours



336 Hours



432 Hours

Upon application, XCPT™ Rust Blocker flows smoothly over the metal surface to create a uniform coating with a consistent film thickness.

Conclusion

As can be seen from the photographic sequences, XCPT™ Rust Blocker significantly outperforms LPS3 Rust Inhibitor, ACF50, Cor-ban 23 and Corrosion X with regard to corrosion inhibition as assessed according to the ASTM B117 methodology.

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