Efficient Evaluation of Amorphic Corrosion Resistance using Accelerated EIS

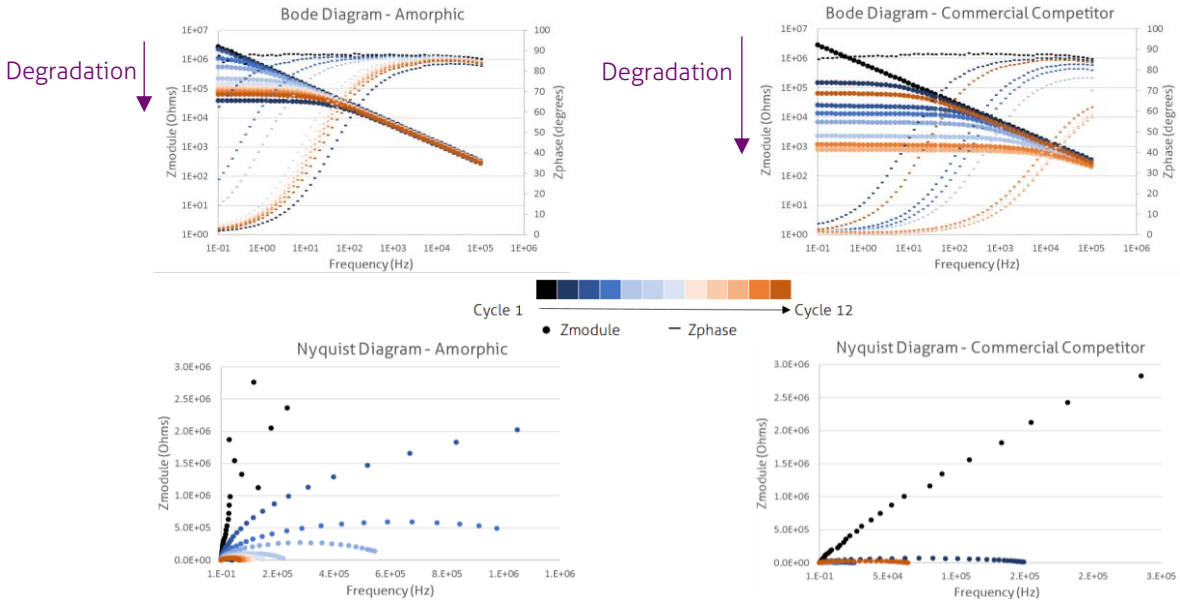
For our customer Bunge Amorphic Solutions, VLCI has evaluated their Amorphic anti-corrosive pigment via various electrochemical methods, using a potentiostat (Electrochemical Impedance Spectroscopy (EIS), Linear Polarization Resistance (LPR)). Amorphic has shown excellent performance against a commercial competitor.

About Accelerated Electrochemical Impedance Spectroscopy (ISO 17463)

Accelerated EIS (EIS via AC-DC-AC or ACET) allows comparing the protective and anti-corrosive properties of different coating systems on metal substrate in a very short time of 24 hours. This method consists in applying cycles of EIS, cathodic polarization and potential relaxation, to accelerate the degradation of the metal-coating system.

Evaluating the performance of Amorphic in protective coatings

Using accelerated EIS (ISO 17463), VLCI has screened the performance of Amorphic in a solvent-based coil coating formulation, and compared it with a commercial competitor.



As seen in the graphs above, the coatings degrade with each cycle. The sample based on the commercial competitor shows a very low corrosion resistance, and fails after only two cycles. The sample based on Amorphic degrades more slowly with each cycle and shows higher impedance values (higher barrier) than the commercial competitor. After the 12 cycles, the Amorphic-based coating doesn't show any damage, which confirms its superior anti-corrosion performance.

What are the targeted product developments?

The targeted applications are protective coatings, from high to low PVC levels. VLCI can help you implementing Amorphic in your formulation, to achieve the desired properties, and quickly and efficiently assess the corrosion inhibition using these electrochemical methods.

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