

Challenges for Test-to-Field Correlation in Automotive Corrosion Testing

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Cyclic corrosion tests are used to simulate field corrosion performance by accelerating corrosion mechanisms but fall short in many ways, especially in the case of filiform, galvanic, and crevice corrosion mechanisms. Establishing a Test-to-Field correlation corresponding to the equivalent “field age” for some components or interfaces and how to interpret test results presents challenges during component design and validation. This presentation will outline some of these challenges, emphasizing correlation of under-accelerated corrosion mechanisms, such as galvanic and crevice, as well inputs like stone impingement. It will review General Motors’ approach to developing and improving TtF correlations with regard to these mechanisms and inputs, which includes executing targeted component buybacks and field surveys from the targeted design environments. GM uses data collected from teardown reviews of those buyback parts and field surveys to develop/improve those correlations and to refine or create validation requirements and design best practices.