

UNDERSTANDING OPTIMIZING & MEASURING WATER IN XENON-ARC ACCELERATED WEATHERING FOR AUTOMOTIVE EXTERIOR COATINGS

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Abstract

Continual demands from consumers for highly durable coatings with excellent appearance motivates automotive manufactures and paint suppliers to introduce new coating systems into the marketplace to meet those demands. Typically automotive manufactures require up to five years of Florida exposure for a new paint system before they will implement the new technology. Additionally accelerated weathering lab weathering is used to provisionally approve new technologies while simultaneously monitor the ongoing performance of technologies used in production.

The current commonly accepted state-of –the-art in xenon arch accelerated weathering is SAE J2527 (based on the obsolete J1960). Over the years it has been well documented that J2527 does not adequately predict field failures observed from Florida results.

To improve correlation between outdoor Florida results and accelerated lab weathering results and extensive research project has been undertaken to develop a new test procedure. In the cores of the research all of the critical factors related to coatings failures are being explored.

This paper details the experiments undertaken to better understand and characterize moisture in the service environment. Additionally it reports on the moisture delivery systems of current xenon arc accelerated weathering equipment. Specifically if

discusses water volume and uniformity. Also detailed are the experiments and conclusions on how to reproduce the moisture observed in outdoor weathering in xenon arc accelerated weathering devices. Additionally it reports on work recently completed to better match the solar spectrum. Concluding with the steps being undertaken to conclude the development and produce a better accelerated.

The data and the theoretical model can be used as a basis to develop artificial weathering tests with improved temperature conditions. This could be used for a better estimation of service life of colored materials.