

The Science of Superior Performance.

Valspar used Scanning Electron Microscopy (SEM) to determine the functionality of the coatings on the metal surface to determine what is happening in between the coating layers, and to evaluate the corrosion cell at the scribe after exposure to a corrosive environment.

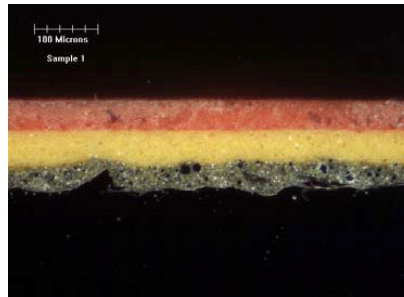
Purpose: The goal was to determine what types of mechanisms were being deployed to provide enhanced performance of the Aquaguard™ coating system after application and during exposure to a corrosive environment.

Procedure: All coatings were applied over shot blasted steel. Panels were exposed to 710 hours of salt spray exposure. Exposed and Unexposed panels were analyzed using SEM instrumentation. Corrosion on the exposed panels was analyzed at the scribe area. The standard zinc rich primer, epoxy mid coat, and acrylic topcoat system was used as a control.

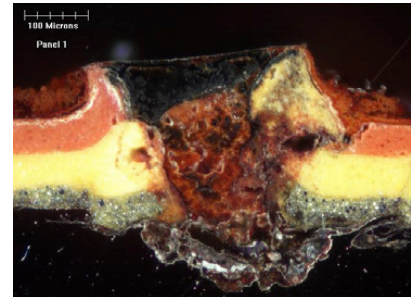
Solvent-Borne Control Panel



Topcoat	KXR0306	40 – 50 micron
Mid Primer	EXY0090	40 – 50 micron
Primer	EEG0032	25 micron



Before Testing

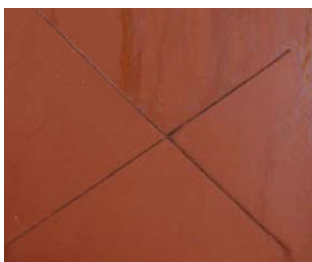


After 710 Hours Salt Spray Exposure

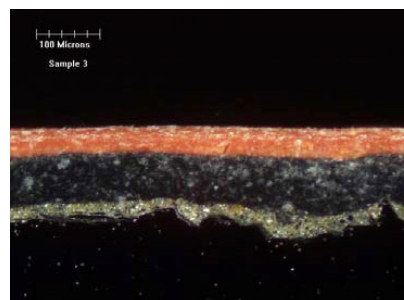
Corrosion resistance of this zinc rich primer, epoxy mid coat and acrylic topcoat industry control. The corrosion cell, (defined as the area below the coating substrate interface) was measured at 310 micron wide and a pit depth of 95 micron.

The depth of pit shows just how far into the container the corrosion was able to reach.

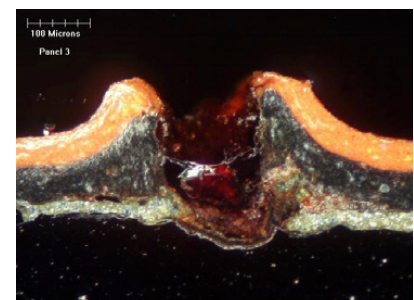
Aquaguard™ System



Aquaguard™ Topcoat	WLR0161	40 – 50 micron
Mid Primer	WLR0009-P	50 – 60 micron
Primer	Zinc Rich Shop Primer	10 micron



Before Testing



After 710 Hours Salt Spray Exposure

The corrosion cell was reduced by approximately 60% compared to the Panel 1 control.

There is noticeably less red rust inside the scribe.

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Observations:

- SEM analysis was unable to distinguish any chemical bonding or changes in chemistry at the interfacial areas.
- The Aquaguard™ primer full encapsulates the shot blast metal when applied at 50 micron of total dry film.
- The zinc rich shop primer applied between 10 and 50 microns encapsulates the shot blast metal profile. The Aquaguard™ primer adheres directly to the zinc rich primer, and bonds to the metal at any exposed area of the substrate that the shop primer missed.
- The combination of the Aquaguard™ coatings high density, chemical adhesion, and anticorrosive properties provides superior corrosion protection compared to the standard zinc rich primer, epoxy mid coat, and acrylic.
- The combination of the zinc rich shop primer, Aquaguard™ mid coat, and Aquaguard™ topcoat provides a synergistic positive effect on anticorrosive properties compared to the current solvent based control.

Conclusions:

The Aquaguard™ primer and topcoat system has...

- **Superior performance** as a DTM and or when used in combination with a zinc rich shop primer in the steel container industry.
- Provides barrier protection that **prevents the start of the corrosion cell** at the metal interface when applied at the recommended film thicknesses. This protection is further enhanced over the zinc rich shop primer.
- **Slows the growth of the corrosion cell** in damaged areas of the film, **reduces the width of corrosion** at the scribe, and **reduces the depth of pitting** into the metal substrate at the scribe.

For more information on Aquaguard™ visit
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