



WHITE PAPER:

RWM FINISHES: 696 HOUR SALT SPRAY TEST

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RWM offers a vast variety of different finishes on our products. In order to really see how much exposure to the elements our finishes could take, we conducted a study on six of our most popular (or widely used) finishes.

These include:

- Black E-coat: E-coating is a method of painting which uses electrical current to deposit the paint.
- Military Spec Paint: Military spec paint is an epoxy coating finish that meets the standards of military specifications.
- Powder Coat: Powder Coat is a polyester or epoxy powder, which is heated to fuse into a protective layer.
- Wet paint: Wet Paint is a liquid based paint applied via a paint sprayer to the metal.
- Zinc Type I: A trivalent chromium coating that is silver or grey in color that protects the metal against corrosives
- Zinc Type II: A trivalent chromium coating that is usually gold in color that protects the metal against corrosives.

We subjected the above six finishes to a strenuous ASTM B 117 salt spray test. This particular test was chosen to discover how well a myriad of industrial finishes perform when compared to each other in a controlled corrosive environment. Particular interest was placed on how barrier coatings such as E-coat, Military paint and Powder coat perform against more common industrial caster standard finishes such as Type I silver and Type II gold zinc plate.

THE SALT SPRAY TEST

The ASTM B 117 salt spray test is a very popular corrosion test designed to provide corrosion resistance information on metals and coated metals. The ASTM B 117 test standard has also been approved for use by Department of Defense agencies. The main reason to consider running an ASTM B 117 test is to compare the corrosive resistance of several different metals or finishes on a product in a controlled environment. With a visual inspection following a B 117 corrosion exposure, you can determine the suitability of coatings, paints and metals to resist corrosion or exposure to the environment, especially marine environments. The salt spray testing was performed in a salt spray chamber using 5% salt solution at 95 degrees F. The test chamber was operated and maintained in accordance with ASTM B 117.



SPRAY TEST MACHINE

THE RESULTS

Each finish was applied to one of RWM's standard caster top plate and then entered into the spray test. The top plates were exposed to the salt spray for 72 hours before being examined. The photos below were taken of each finish after this period of time.



E-COAT 72 HRS.



MILITARY SPEC PAINT 72 HRS.



STANDARD POWDER COAT 72 HRS.



WET PAINT 72 HRS.



TYPE II ZINC PLATE 72 HRS.



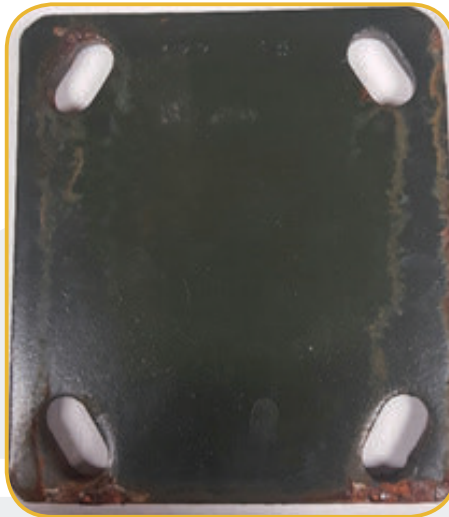
TYPE I ZINC PLATE 72 HRS.

After 72 Hours in the salt spray machine, you can see that the e-coat, powder coat and military spec paint show very little corrosion or breakdown of any kind. However, the wet paint, and both type I and type II zinc plates are showing more prominent signs of corrosion. The wet paint is showing heavy signs of rust while the zinc plates have been eaten through by the salt spray environment

After recording the corrosion of each of the finishes, the top plates were, once again, reinstated to the salt spray test. This time we wanted to really test the strength of the finishes. We ran the second salt spray test for a total of 696 hours before taking them out of it. The pictures below show the extent of the corrosion on each of the finishes after exposed to nearly a month of salt spray.



E-COAT 696 HRS.



MILITARY SPEC PAINT 696 HRS.



STANDARD POWDER COAT 696 HRS.



WET PAINT 696 HRS.



TYPE II ZINC PLATE 696 HRS.



TYPE I ZINC PLATE 696 HRS.

As you can see from the photos, e-coat, powder coat and military paint all hold up extremely well even when subjected to such a long duration test. However, the wet paint, as well as, types I and II zinc plate finishes show substantial corrosion at the end of the test.

WHAT DOES THIS MEAN?

As the photo evidence shows, the e-coat, military spec paint and our standard powder coat hold up much better in a corrosive environment than standard wet paint and both type I silver and type II gold zinc plates. The zinc plates are much more prone to white corrosion as the zinc is sacrificed to protect the metal. Different types of zinc plating are popular in the caster industry. Zinc plating is what's called a sacrificial coating. For more information on this see our [whitepaper on zinc plating](#).

After the results of the test, the zinc plating has completely been eaten through to the point of white rust completely covering the top plate. Whereas, the e-coat, military spec paint and powder coat show very little breakdown even after 696 hours in a salt spray environment. These three finishes provide a stronger resistance to the corrosive atmosphere.