



- 4119 White Bear Parkway, St. Paul, MN 55110 USA
- Phone: (651) 429-1100, Fax: (651) 429-1122
- Toll Free: (800) 4-CORTEC, E-mail: info@cortecvci.com
- cortecvci.com • corteclaboratories.com

Evaluating Rust Preventive Liquids for Customer

To: Curt Hill

For: Customer

From: Cortec Laboratories, Inc.
4119 White Bear Parkway
St. Paul, MN 55110

cc: Boris Miksic
Cliff Cracauer
Robert Kean
Jay Zhang

Project #: 17-018-1825.bis

Results reported by:

A handwritten signature in black ink that reads "Eric Uutala".

Eric Uutala
Technical Service Manager



Background:

The customer is an industry leader in the design, development, manufacture, and delivery of driveline systems and solutions.

The current rust preventive process is as follows: parts are placed in thermoformed plastic trays and then sprayed with Rustilo 4135HF. Multiple trays of parts are then stacked on each other prior to shipment and storage. Corrosion issues are being experienced and this may be partially due to rust preventive not fully coating the parts. In addition to the ongoing corrosion issue, the customer would like to explore products that are more environmentally friendly than Rustilo 4135HF.

This test will attempt to recreate the customers product application process (without the thermoformed plastic trays), with two Cortec products that will also address the concerns related to environmental friendliness.

Sample Received:

Rustilo 4135HF liquid, in a 1 liter plastic container
Two types of machined metal parts, four of each type

Method:

Large Environmental Cabinet (120+/-5F, >90% relative humidity)

Materials:

VpCI-325 (batch# 192116)
EcoLine 3220 (batch# 15235)
Non-VCI clear polyethylene (PE) zip top bags

Procedure:

- 1) All parts were visually inspected for corrosion prior to testing.
- 2) Four sets of parts were then prepared as follows, to most closely simulate customers current process:
 - a. Parts were placed in non-VCI PE zip top bags.
 - b. In three of the bags, a small amount of one of the respective rust preventives was sprayed into bag.
 - i. The fourth set of parts was not treated with any rust preventive, and was tested as a control.
 - c. Parts were then sealed in their respective bags.
 - d. Parts were placed on a flat plastic tray, which was set in Cortec's Large Environmental Cabinet.
 - e. All parts were visually inspected periodically.
 - f. After 600 hours, all parts were removed from the test chamber.
 - g. Parts were visually inspected and photographed.

Results:

Part Treatment	Time to Corrosion
None (Control)	312 hours
Rustilo 4135HF	600 hours
VpCI-325	No Corrosion
EcoLine 3220	No Corrosion

Photos:



Figure 1: customer parts, after 600 hours in testing. From left to right: Control, Rustilo 4135HF, VpCI-325, EcoLine 3220.

Interpretations:

In an attempt to recreate the process used by the customer, parts were placed flat/face down on a plastic tray during testing. Although this tray was not thermoformed for the parts, application of the rust preventive was focused on the “top” of the part, and not sprayed on the entire part. After 600 hours of testing, both parts sprayed with Rustilo 4135HF showed signs of corrosion. Conversely, the parts sprayed with VpCI-325 were corrosion free, as were those coated with EcoLine 3220.

In addition to providing increased corrosion protection, the customer would also like a rust preventive that is more environmentally friendly. VpCI-325 utilizes vegetable oil as a base, and EcoLine 3220 is certified as 99% BioBased by the USDA BioPreferred Program (<https://www.biopreferred.gov/BioPreferred/>).