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Certificate # L2267 Testing

Evaluating Corrosion Protection Solutions for Customer

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Project #: 10-207-1825 (bis)

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Date: November 30, 2010

Background: Customer sent a box of stamped shells to Cortec, along with samples of plastic film and liquid rust preventive they currently use. The corrosion inhibiting properties of these products will be evaluated and compared to similar Cortec products.

Sample Received: Six stamped metal shells
Green polyethylene film (manufacturer unknown)
Rust Veto 4225 liquid

Method: ASTM D-1735 Water Fog Cabinet (100°F, 95% relative humidity)

Materials: Stamped metal shells
Green polyethylene (PE) film
Rust Veto 4225
VpCI-126 Blue Film
VpCI-325 rust preventive liquid

Procedure: The following procedure was used:

1) Prior to testing, all shells were cleaned with methanol to remove any dirt or other contamination.
2) After cleaning, two of the shells were dipped in rust preventive liquids as follows:
    a. One shell was dipped in Rust Veto 4225.
    b. One shell was dipped in VpCI-325.
3) These two shells were allowed to drip dry overnight.
4) Next, the shell dipped in Rust Veto 4225 was packaged in green PE film from Customer. A second shell, not dipped, was also packaged in the green PE film.
5) The shell dipped in VpCI-325 was packaged in VpCI-126 film.
6) Two additional shells were individually packaged in VpCI-126 film.
    a. A small piece of VpCI-130 foam (~2”x2”) was also added to one of these packages.
7) All bags were then heat sealed and allowed to condition overnight prior to further testing.
8) All five packaged shells, along with an unpackaged control shell, were then placed in ASTM D-1735 water fog testing.
9) All shells were visually inspected periodically.
10) After 1000 hours, all shells were removed from ASTM D-1735 water fog testing.
11) All shells were visually inspected and photographed.

Results: The following results were found:

Rust Preventive	Time to Failure (Hours)
Control	72
Green PE Film	<24
Green PE Film + Rust Veto	720
VpCI-126	624
VpCI-126 + VpCI-130	792
VpCI-126 + VpCI-325	DNF*

DNF – Did not fail during 1000 hours of ASTM D-1735 testing.

Pictures:

Interpretations: The use of VpCI-126 provided the excellent corrosion protection on the shells from Customer. When used in combination with VpCI-130 foam or VpCI-325, the protection was the best.

The shell packaged in the green film supplied by Customer corroded the most severely of any of the parts; even more than the control part. This indicated a lack of contact corrosion protection properties in the film.