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***Corrosion Testing of Different Liquid  
Rust Preventatives on Metal Cans***


**To:** Customer

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**Project #:** 13-122-1825.bis

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**Background:** The customer currently uses 2 different soluble oils and they are looking to improve the corrosion protection with a Cortec additive. Additionally, Cortec water based rust preventatives will be compared to their current rust preventative.

**Samples Received:** Pro Draw 3049  
Tuf Draw 2806  
Beaver RP 7  
10 steel cans

**Method:** ASTM D-1735 (Water Fog Test)

**Materials:** VpCI-377 (06772)  
BioCorr (03673)  
Methanol  
Received sample liquids  
Received metal samples

**Procedure:** The following procedure was used:

1. Clean each metal can with methanol and wipe dry
2. Coat each can with the following treatments and dilutions:
  - a. Nothing (Control)
  - b. VpCI-377 at 5% in water
  - c. VpCI-377 at 10% in water
  - d. BioCorr
  - e. Beaver RP 7 at 5% in water
  - f. Beaver RP 7 at 21% in water
  - g. Pro Draw at 15% in water
  - h. Pro Draw with 5% M-250 at 15% in water
  - i. Tuf Draw at 15% in water
  - j. Tuf Draw with 5% M-250 at 15% in water
3. Allow the parts to dry overnight
4. Place each part in a non-VCI polyethylene bag
5. Place parts in ASTM D-1735 chamber
6. Monitor parts daily for visual corrosion
7. Remove parts after 408 hours and photograph

**Results:****Table 1: ASTM D-1735 Results**

Treatment	Time until Failure
Control	48 hours
VpCI-377 at 5%	336 hours
VpCI-377 at 10%	408 hours
BioCorr	408 hours
RP-7 at 5%	312 hours
RP-7 at 21%	*DNF
Pro Draw	48 hours
Pro Draw + M-250	72 hours
Tuf Draw	120 hours
Tuf Draw + M-250	120 hours

\*DNF = did not fail during 408 hours

**Interpretations:**

The results show that adding M-250 only marginally improved the corrosion protection of the soluble oils. BioCorr is also an emulsified oil, but provided significantly better corrosion protection than either the Pro Draw or Tuf Draw. The corrosion seen on the cans coated in these products is worse than the control. After each part reached corrosion failure, areas of severe corrosion quickly formed, especially where the polyethylene bag contacted the can.

The rust preventatives compared to Beaver RP-7 all showed good corrosion protection. The best protection was provided by RP-7 at 21%; however, this is a much higher dilution than typically used for water based rust preventatives. This dilution was only used because the customer titration chart called for a dilution of 21%  $\pm$  2%. BioCorr and VpCI-377 at 10% both provided very good corrosion protection and did not fail until after 400 hours.

**Photos:** Taken after 408 hours of humidity testing



Control      Tuf Draw      Tuf Draw + M-250      Pro Draw      Pro Draw + M-250



BioCorr      VpCI-377 (5%)      VpCI-377 (10%)      RP-7 (5%)      RP-7 (21%)