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***Evaluating Rust Preventive Systems for  
Crankshaft Sections***

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**For:** Customer

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**Project #:** 13-156-1825.bis

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**Background:** Customer sent nine camshaft sections to Cortec for evaluation. They would like their current rust preventive system compared to similar options from Cortec.

**Sample Received:** Nine camshaft sections  
Cimguard 20 Corrosion Preventive Fluid  
Yellow film (manufactured by Excor, NTI, Zerust, Valeno)  
Blue film (manufactured by Laddawn)

**Method:** ASTM D-1735 Water Fog

**Materials:** Nine camshaft sections  
Cimguard 20 Corrosion Preventive Fluid  
Yellow film (manufactured by Excor, NTI, Zerust, Valeno)  
Current blue film (manufactured by Laddawn)  
VpCI-126 Blue Film (Batch #310220)  
VpCI-329D (Batch #16132)  
BioCorr Rust Preventative (Batch #13013)

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

- 1) Prior to testing, all camshaft parts were visually inspected, cleaned with laboratory grade methanol, and allowed to dry.
- 2) After cleaning, camshaft parts were prepared as follows:
  - a. Wrapped in yellow film.
  - b. Wrapped in current blue film.
  - c. Wrapped in VpCI-126 Blue Film.
  - d. Dipped in Cimguard 20 (neat), allowed to air dry.
  - e. Dipped in Cimguard 20 (neat), immediately packed in yellow film.
  - f. Dipped in BioCorr (neat), allowed to air dry.
  - g. Dipped in BioCorr (neat), allowed to air dry, and then packed in VpCI-126 Blue Film.
  - h. Dipped in VpCI-329D (neat), allowed to air dry.
  - i. Dipped in VpCI-329D (neat), allowed to dry, and then packed in VpCI-126.
- 3) After preparations, all parts were allowed to sit in lab conditions overnight.
- 4) All parts were then placed in ASTM D-1735 water fog cabinet.
- 5) All parts were visually inspected periodically.
- 6) After 600 hours, all parts were removed from ASTM D-1735 water fog cabinet.
- 7) All parts were unwrapped, visually inspected, and photographed.

**Results:** The following results were found:

Product(s) Used	Time to Corrosion (Hours)
Cinguard 20	48
BioCorr	72
VpCI-329D	72
Blue Film (Current)	120
Yellow Film	72
Cinguard 20 + Yellow Film	24
VpCI-126 Blue Film	288
BioCorr + VpCI-126	600
VpCI-329D + VpCI-126	DNF*

DNF – Did not fail during 600 hours of ASTM D-1735 testing.

**Photos:**



Figure 1: Cinguard 20, BioCorr, and VpCI-329D (left to right) treated parts, after 600 hours of testing. These parts were not wrapped in film for testing.



Figure 2: Blue film (current) wrapped part, after 600 hours of testing.



Figure 3: Yellow film wrapped part, after 600 hours of testing.





Figure 4: Cimguard 20 + Yellow film wrapped part, after 600 hours of testing.



Figure 5: VpCI-126 wrapped part, after 600 hours of testing.



Figure 6: BioCorr + VpCI-126 wrapped part, after 600 hours of testing.



Figure 7: VpCI-329D + VpCI-126 wrapped part, after 600 hours of testing.

**Interpretations:**

After 600 hours of testing in ASTM D-1735 water fog conditions, the best corrosion protection system was VpCI-329D and VpCI-126. The system of BioCorr and VpCI-126 provided similar protection. The part treated with Cinguard 20 and packed in yellow film (while the part was still wet) had the most severe corrosion at the end of testing.