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Comparing Ferrocoat to Similar Cortec Products for Protection of Camshafts

Purpose: Evaluate and compare the corrosion protection provided by Ferrocoat and similar Cortec products on camshafts. Also, evaluate VCI properties of films currently used by customer.

Method: ASTM D-1748 humidity (120°F, ~95% relative humidity)
 VIA Test (Federal Standard 101C, Method 4031, Procedure B)
 Razor Blade Test (CC-004)
 Nitrite Test

Materials: 4 camshafts
 Ferrocoat rust preventive liquid
 Unidentified cutting fluid
 VpCI-325
 VpCI-329D
 4-mil and 1 mil yellow film

Procedure: The following procedure was used:

- 1) VIA and Razor Blade testing were performed (on the submitted yellow films) according to their respective work instructions.
- 2) Nitrite content of the films was analyzed using standard nitrite test strips.
- 3) The 4 submitted camshafts were cleaned with methanol in preparation for testing.
- 4) After cleaning, the camshafts were coated with the following products:
 - a. No coating (control)
 - b. Ferrocote Oil-based RP
 - c. VpCI-325
 - d. VpCI-329D
- 5) After coating, the parts were allowed to air dry overnight.
- 6) After drying, the parts were placed in ASTM D-1748 humidity cabinet.
- 7) All the parts were visually inspected periodically.
- 8) After 432 hours, all parts were removed from ASTM D-1748 humidity cabinet.
- 9) The parts were then visually inspected and photographed.

Results: The following results were found:

VIA Testing

	Plug 1	Plug 2	Plug 3
Control	Grade 0	N/A	N/A
Yellow Film (4-mil)	Grade 3	Grade 3	Grade 2
Yellow Film (1-mil)	Grade 2	Grade 2	Grade 2

Note: VIA Test grades explained below.

Razor Blade Testing

	Panel 1	Panel 2	Panel 3
Yellow Film (4-mil)	Pass	Pass	Pass
Yellow Film (1-mil)	Pass	Pass	Pass

ASTM D-1748 Humidity Testing

Part ID	Time to Failure (Hours)
A	<8
B	336
C	432
D	432

Conclusion: The camshafts from customer are very susceptible to corrosion, as evidenced by the quick onset of corrosion on the control part. All three of the rust preventives tested performed very well, with each protecting the part for 2 weeks or more. The Cortec products, VpCI-325 and VpCI-329D, provided 96 hours more protection than the Ferrocote product.

Film testing showed that the submitted yellow film provided both contact and vapor phase protection. Both films showed heavy amounts of nitrite compounds.

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VIA Test Grades (Grade 2 or 3 are passing)

- Grade 0: Blind test
No corrosion inhibiting effect
- Grade 1: Blind test
Minute corrosion inhibiting effect
- Grade 2: Blind test
Medium corrosion inhibiting effect
- Grade 3: Blind test
Good corrosion inhibiting effect





