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LABORATORY ACCREDITATION BUREAU
ACCREDITED ISO/IEC 17025
Certificate # L2267 Testing

Evaluation of VCI Films from India

To: Bob Boyle

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Project #:11-253-1125

Test conducted by: Liz Austin

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Approved by: M. Kharshan

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Background: The customer is currently using Daubert oil and Daubert VCI film, but is still having corrosion issues. Daubert has recommended using more products to provide corrosion protection. The customer requested an alternative corrosion preventive system be found. The customer requested that VpCI-126 be compared to the submitted films, to determine if there is a difference in corrosion protection.

Samples Received:

1) Green Daubert VCI India film, unlabeled, good condition, received 11-22-11
2) Light yellow film, Zerust India, from Craftsman, good condition, received 11-22-11
3) Dark yellow film, unlabeled, good condition, received 11-22-11

Method:

1) VIA Test CC-027
2) Razor Blade Test CC-004*
3) FTIR Test CC-006

*Cortec laboratory is not accredited for the test marked

Materials:

1) VIA test kit
2) Razor Blade test kit
3) Perkin Elmer Paragon 1000 Spectrophotometer
4) VpCI-126 Lot#30688

Procedure:

1) The tests were performed according to standard procedures.

Results:

Razor Blade Carbon Steel

Sample	Panel 1	Panel 2	Panel 3
Zerust VCI India Film	Pass	Fail	Fail
Dark Yellow Film	Fail	Fail	Fail
Green Daubert film	Pass	Fail	Fail
VpCI-126	Pass	Pass	Pass
Control	Fail	-	-

Razor Blade Copper

Sample	Panel 1	Panel 2	Panel 3
Zerust VCI India Film	Fail	Fail	Fail
Dark Yellow Film	Pass	Pass	Pass
Retest Dark Yellow Film	Pass	Pass	Pass
Green Daubert film	Pass	Fail	Fail
VpCI-126	Pass	Pass	Pass
Control	Fail	-	-

VIA Test Results

Sample	Plug #1	Plug #2	Plug #3
Zerust VCI India Film	Grade 0	Grade 0	Grade 0
Dark Yellow Film	Grade 0	Grade 0	Grade 0
Green Daubert film	Grade 1	Grade 1	Grade 0
VpCI-126	Grade 3	Grade 3	Grade 2
Control	Grade 0	-	-

Note: The VIA grading system is attached to the end of the report

Interpretations:

1. Based on the test results, the light yellow Zerust VCI India film did not provide contact-phase corrosion protection for copper and carbon steel. The results of the VIA test determined that it also did not provide vapor-phase corrosion protection. This film is nitrite-based and contains an insufficient amount of corrosion inhibitor.
2. The test results for the dark yellow film determined it did not provide sufficient contact-phase corrosion protection for carbon steel, but it did provide protection for copper. The dark yellow film also did not provide vapor-phase corrosion protection, based on the VIA results. FT-IR test results are showing an insufficient amount of corrosion inhibitors.
3. The razor blade results for the green Daubert film determined that it did not provide sufficient contact-phase corrosion protection. It also did not provide vapor-phase corrosion inhibition according to the VIA test results. Film is nitrite-based.
4. VpCI-126 provides sufficient vapor and contact-phase corrosion protection.

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