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***Evaluation of Daubert Film and Zerust Paper
Compared to VpCI-126 Film and VpCI-146 Paper***

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Background: Our customer is a manufacturer of needle roller bearings. They are experiencing 'etching' on their parts during transport to Mexico from Quebec. These etches are around the circumference of the cylinder, approximately 1/32" wide, and are rusting by the time they arrive to Mexico. The customer is using Daubert film and Zerust paper to protect the parts from corrosion, but have asked Cortec for lab testing to compare these products to VpCI-126 film and VpCI-146 paper.

Samples Received: The following samples were received on 9-9-19 in good condition:

1. Blue Daubert film bag, 2mils
2. Zerust paper

Method: NACE Standard VIA Test, TM 0208-2018
FTIR Analysis, CC-006
Razor Blade Test, CC-004*
Nitrite/Nitrate Test*
*The tests marked are not covered under Cortec Laboratories, Inc. ISO 17025 Scope of Accreditation

Materials: VpCI-146 paper, 35# (batch #235910)
VpCI-126 film, 3mil (batch #410230)
VIA test kit (testing jars with lid apparatus, steel plugs, 400grit sandpaper)
Steel panels, SAE 1008/1010 (Q-Panel, S-35 DG, 3"x5"x0.032")
Copper panels
Glycerol (lot #W20E023)
Nitrite/Nitrate Test Strips (lot #HC719626)
Methanol, ACS grade (lot #18F066507)

Procedure: For VIA testing, the procedure was followed according to the NACE VIA Test, TM0208-2018 option 2 (option 2 uses machine-aided grinding and polishing for the steel plugs).

Note- the VIA tests were conducted using two strips of sample per jar (1" X 6" per strip)

The FTIR analysis and razor blade testing was followed according to standard procedure.

Results: The following results were found:

Razor Blade Test- Steel Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
Daubert Film	Fail	Fail	Fail	Fail
Zerust Paper	Pass	Pass	Pass	Pass
VpCI-146 Paper*	Pass	Pass	Pass	Pass
VpCI-126 Film*	Pass	Pass	Pass	Pass
Control	Fail	-	-	Fail

*Note- The razor blade and VIA results for VpCI-126 film and VpCI-146 paper were previously tested (from 16-083-1125)

Results:

The following results were found:

Razor Blade Test- Copper Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
Daubert Film	Pass	Pass	Pass	Pass
Zerust Paper	Pass	Pass	Pass	Pass
VpCI-146 Paper*	Pass	Pass	Pass	Pass
VpCI-126 Film*	Pass	Pass	Pass	Pass
Control	Fail	-	-	Fail

NACE VIA Test

Sample	Plug #1	Plug #2	Plug #3
Daubert Film	Grade 0	Grade 0	Grade 0
Zerust Paper	Grade 2	Grade 2	Grade 1
VpCI-146 Paper*	Grade 3	Grade 3	Grade 3
VpCI-126 Film*	Grade 3	Grade 3	Grade 2
Control	Grade 0	-	-

*Note- The razor blade and VIA results for VpCI-126 film and VpCI-146 paper were previously tested (from 16-083-1125)

Nitrite/Nitrate Test Strips

Sample	Results
Daubert film	Contains nitrite/nitrate
Zerust paper	Contains nitrite/nitrate

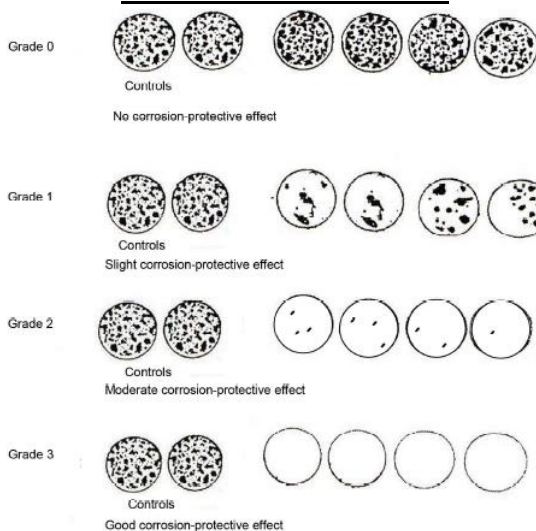
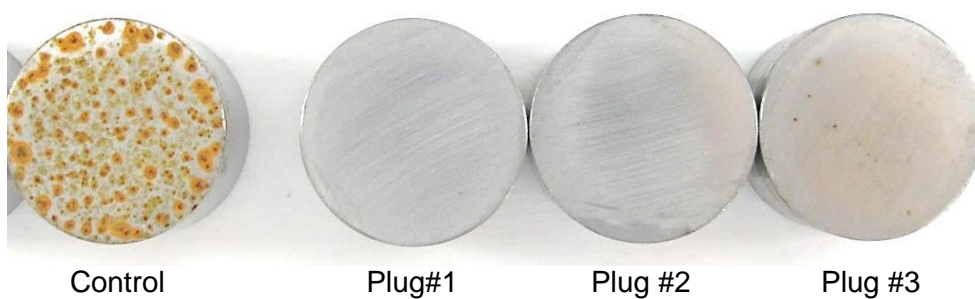
VIA Test Grades

Photo from the NACE VIA test:

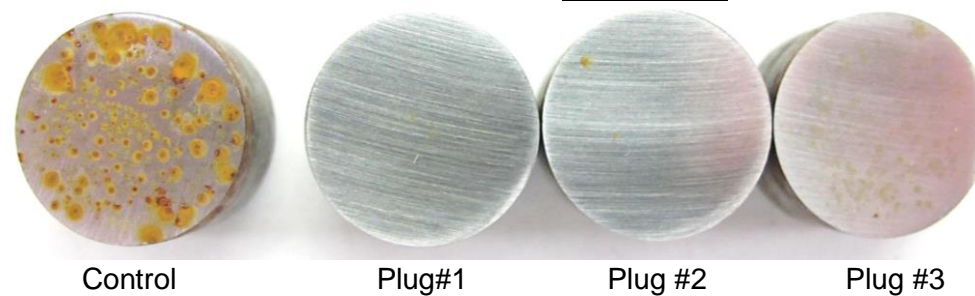
Daubert film



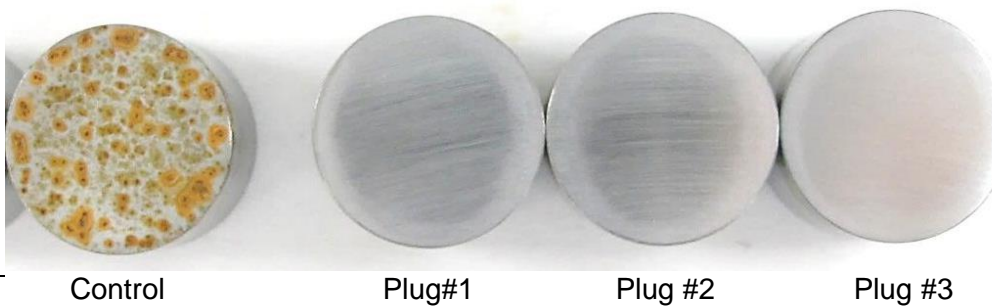
VpCI-126 film



Zerust paper

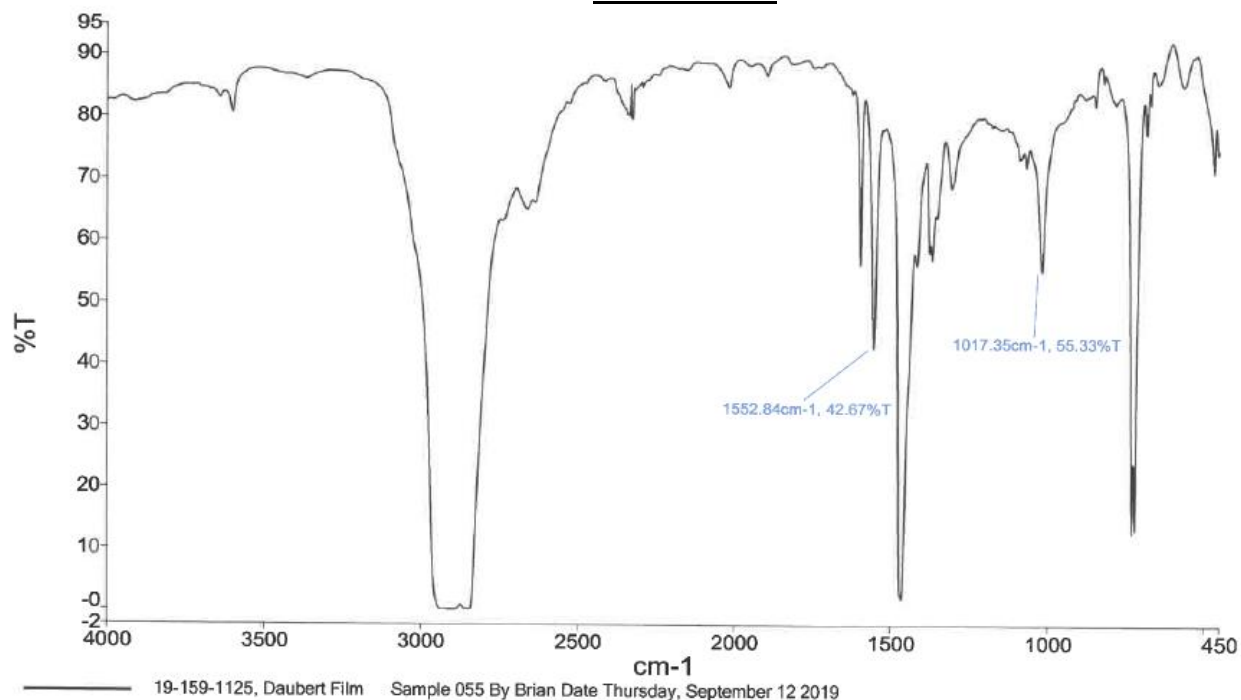


VpCI-146 paper



FTIR Analysis:

Daubert Film



Interpretations:

According to the results of the VIA and razor blade testing, Cortec's VpCI-126 film provides better vapor phase and contact corrosion protection than the submitted Daubert film. Cortec's VpCI-146 paper also provides better vapor phase corrosion protection than the Zerust paper, although both provide very good contact corrosion protection.