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## ***Evaluation of Armor Film***

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**Background:** Our customer is a stamping company who is currently having corrosion issues with the Armor film they are using to protect parts during shipping. This report will evaluate the chemistry of the film as well as corrosion protection.

**Sample Received:** Blue Armor film, 1.5mils, received on 8-30-19 in good condition.

**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:** VIA test kit (testing jars/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 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
Armor Film	Pass	Pass	Pass	Pass
Control	Fail	-	-	Fail

**Razor Blade Test- Copper Panels**

Sample	Panel #1	Panel #2	Panel #3	End Result
Armor Film	Fail	Fail	Fail	Fail
Control	Fail	-	-	Fail

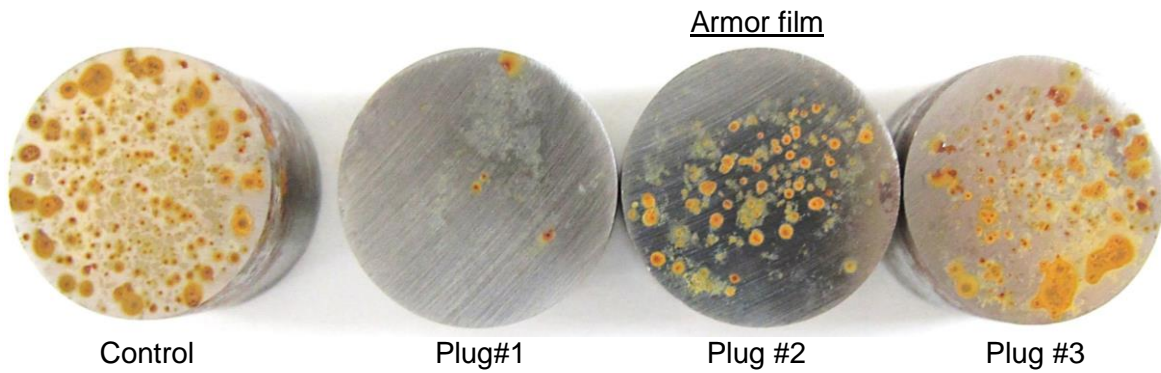
**NACE VIA Test**

Sample	Plug #1	Plug #2	Plug #3
Armor Film	Grade 1	Grade 0	Grade 0
Control	Grade 0	-	-

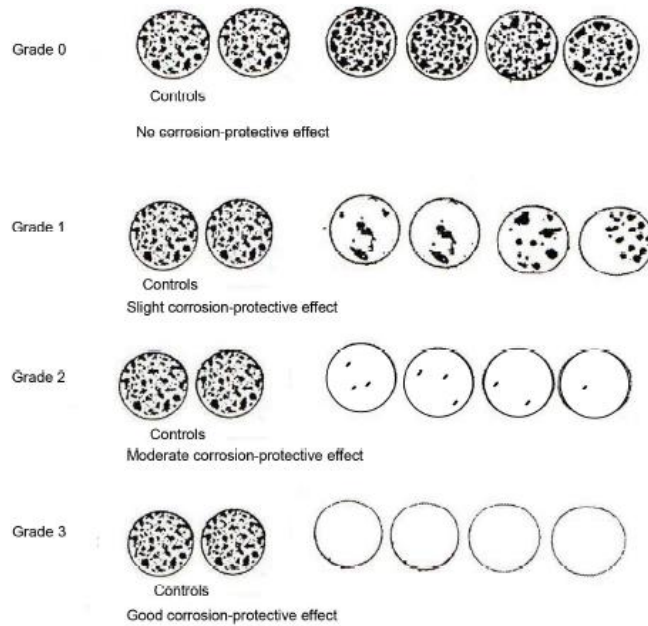
**Nitrite/Nitrate Test Strips**

Sample	Results
Armor Film	Does not contain any nitrite or nitrate

Photo from the NACE VIA test:

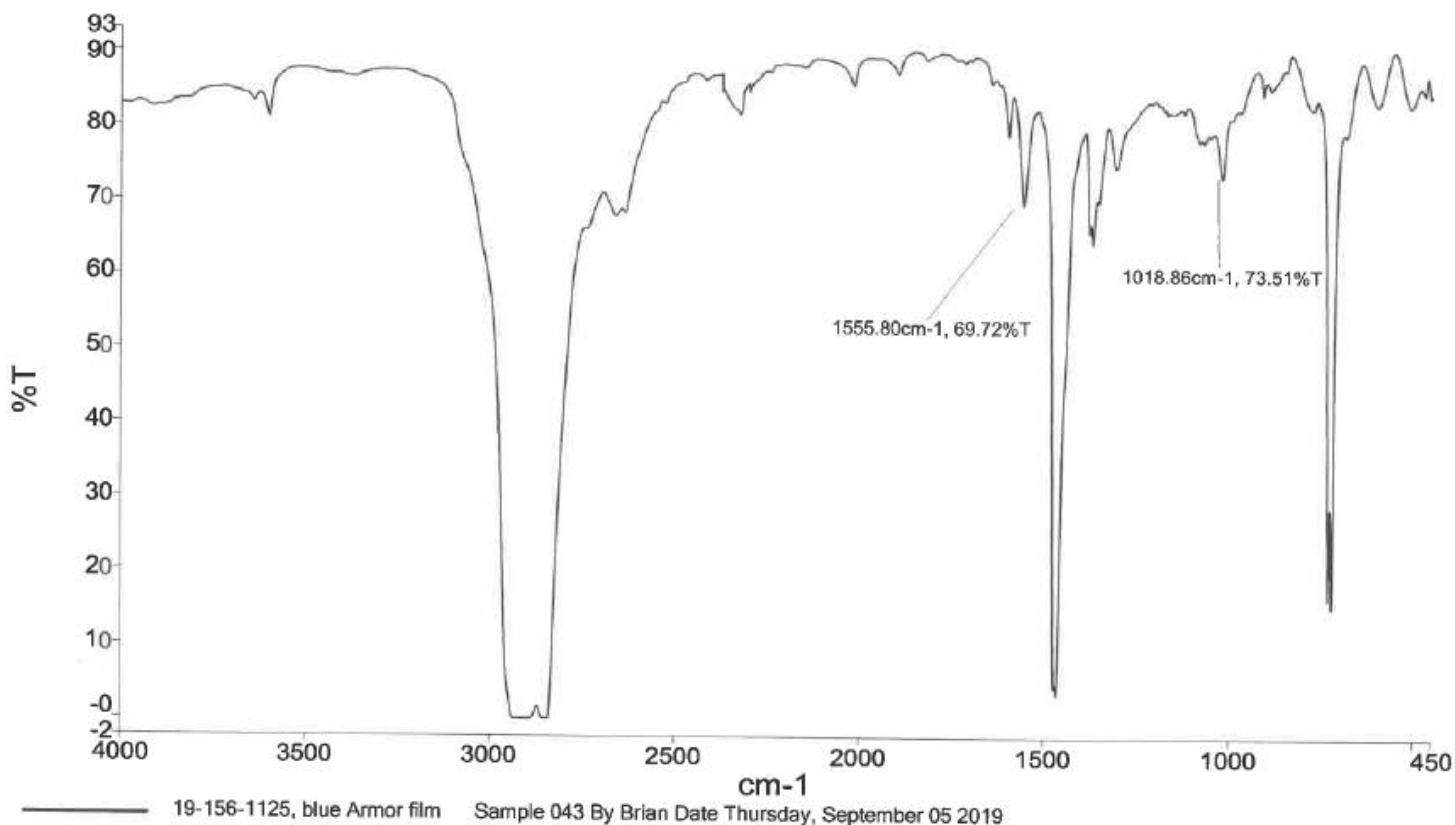


### VIA Test Grades



## FTIR Analysis:

### Blue Armor Film



## Interpretations:

According to the FTIR analysis, the Armor film appears to contain carboxylate type corrosion inhibitors based on the peak observed around 1555 cm<sup>-1</sup>. This film also appears to contain desiccant based on the peak at ~1018 cm<sup>-1</sup>. Both of these peaks are small, however, which would indicate low concentrations.

The results of the NACE VIA test show that the Armor film does not provide good vapor phase corrosion protection. Furthermore, the results of the razor blade test shows that the Armor film only provides contact corrosion protection for steel, but not for copper.