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## ***Evaluation of Zerust-Excor Film and General Plastic's Film Compared to VpCI-126 Film***

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**Project #:** 19-188-1825.bis

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**Background:** Our customer processes a variety of metal gears. They use an RP (Protec T) at various stages of manufacturing, and also in several wash systems. Most parts are coated with the RP and then packaged in VCI bags before shipping. However, they have experienced several corrosion issues potentially based on their current RP/process. Therefore, they have provided two competitor VCI bags for testing against VpCI-126 film. One film is a yellow Zerust-Excor VCI bag and the other is a blue VCI bag made by General Plastic Extrusions, Inc.

**Samples Received:** The following samples were received on 10-21-19 in good condition:  
1. Yellow Zerust Excor VCI film bag, 4mils  
2. Blue VCI film bag, 3.5-4mils, made by General Plastic Extrusions, Inc.

**Method:** NACE Standard VIA Test, TM 0208-2018  
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-126 film, 4mil (batch #510220)  
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 razor blade testing was followed according to standard procedure.

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

**Nitrite/Nitrate Test Strips**

Sample	Results
Zerust-Excor Film	Contains nitrite/nitrate
General Plastic's Film	Contains nitrite/nitrate

**Razor Blade Test- Steel Panels**

Sample	Panel #1	Panel #2	Panel #3	End Result
Zerust-Excor Film	Pass	Pass	Pass	Pass
General Plastic's Film	Pass	Pass	Pass	Pass
VpCI-126 Film*	Pass	Pass	Pass	Pass
Control	Fail	-	-	Fail

**Results:** \*Note- The razor blade and VIA results for VpCI-126 film were previously tested (from 16-083-1125)  
The following results were found:

### Razor Blade Test- Copper Panels

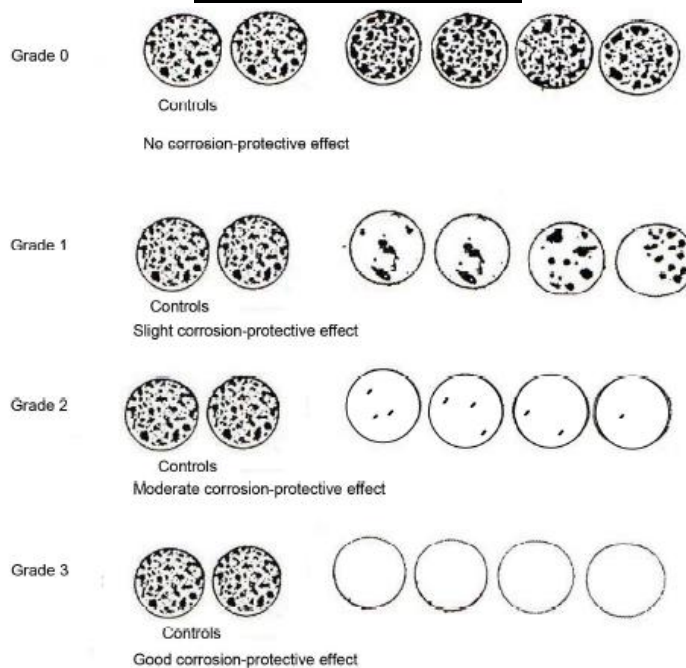
Sample	Panel #1	Panel #2	Panel #3	End Result
Zerust-Excor Film	Fail	Fail	Fail	Fail
General Plastic's Film	Fail	Fail	Fail	Fail
VpCI-126 Film*	Pass	Pass	Pass	Pass
Control	Fail	-	-	Fail

### NACE VIA Test

Sample	Plug #1	Plug #2	Plug #3
Zerust-Excor Film	Grade 0	Grade 0	Grade 0
General Plastic's Film	Grade 0	Grade 0	Grade 0
VpCI-126 Film*	Grade 3	Grade 3	Grade 2
Control	Grade 0	-	-

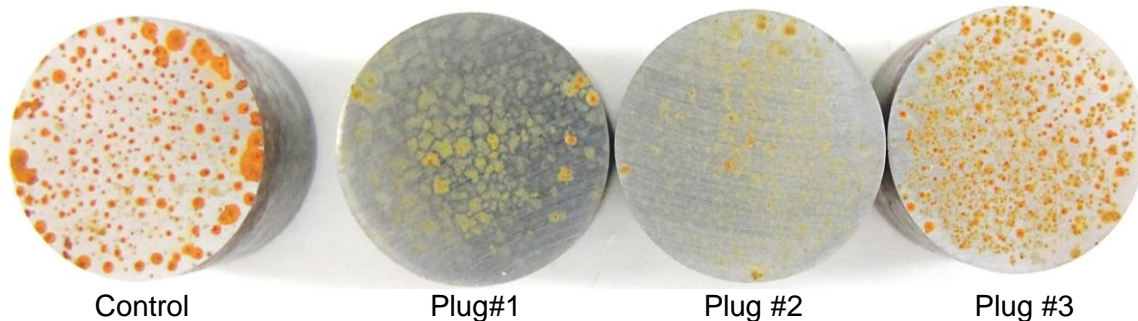
\*Note- The razor blade and VIA results for VpCI-126 film were previously tested (from 16-083-1125)

### VIA Test Grades



**Photos from the NACE VIA test:**

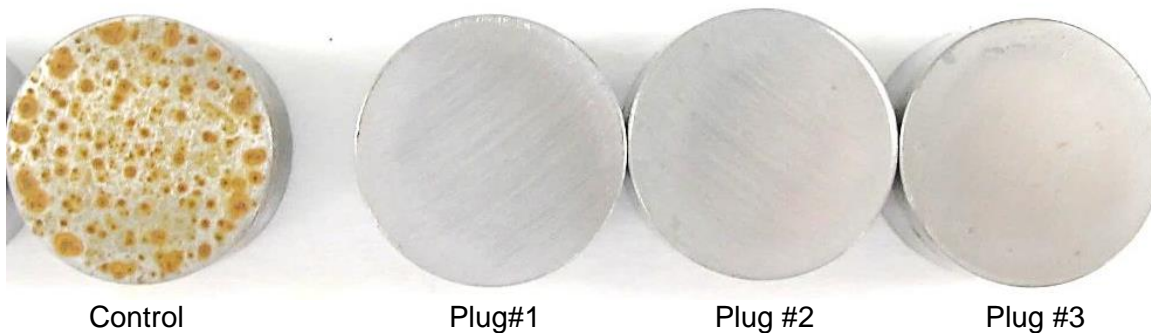
Zerust-Excor Film



General Plastic's Film



VpCI-126 film



**Interpretations:**

The Zerust-Excor film and General Plastic's film submitted by our customer show similar results according to the corrosion testing. Both films contain nitrite/nitrate but provide very poor vapor phase corrosion protection and only provide contact corrosion protection for steel, but not for copper. Compared to Cortec's film, VpCI-126 provides excellent vapor phase corrosion protection and also provides contact corrosion protection for ferrous and non-ferrous metals.