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Evaluating Met Pro VCI-new formulation

Background: Larry Spaeth from Unisource wanted the Met Pro VCI-new formulation film compared to an old version of Met Pro VCI that was tested at Cortec's Lab (project # 07-229-1125). Unisource also wanted the Met Pro VCI-new formulation compared to VpCI-126; Daubert Premium Metal Guard; Armor Poly VCI SWS; and Zerust ROF.

Purpose: Evaluate anticorrosion properties of the following submitted films: Met Pro; Met Pro VCI-new formulation; VpCI-126; Armor Poly VCI SWS; Daubert; Zerust ROF.

Materials: Carbon Steel Panels
Copper Panels
Daubert Premium Metal Guard, 4 mil
Armor Poly VCI SWS, 4 mil
Met Pro VCI, 3 mil
Met Pro VCI-new formulation, 3 mil
VpCI-126, 3 mil, lot # 700210
Zerust ROF, 3 mils
Uncoated Polyethylene film, 3 mil, (control film)
Perkin Elmer FT-IR 1000 Spectrometer
Razor Blade test kit
VIA test kit
FT-IR test kit
EM Quant® Nitrate/Nitrite Test Strips

Method: Razor Blade test
VIA test
FT-IR test
Nitrite test

Procedure: The above tests were performed according to standard procedures for each.



Results:**Nitrite Test**

Film	Nitrite
Armor	Present
Daubert	Present
Met Pro VCI	Present
Met Pro VCI new formulation	Present
Zerust ROF	Not Present
Control	Not Present

Razor Blade Test Performed on Carbon Steel Panels

Film	Panel 1	Panel 2	Panel 3
Armor	Pass	Pass	Pass
Daubert	Pass	Pass	Pass
Met Pro VCI	Fail	Fail	Fail
Met Pro VCI new formulation	Fail	Fail	Fail
VpCI-126	Pass	Pass	Pass
Zerust ROF	Fail	Fail	Fail
Control	Fail	Fail	Fail

Razor Blade Test Performed on Copper Panels

Film	Panel 1	Panel 2	Panel 3
Armor	Fail	Fail	Fail
Daubert	Fail	Fail	Fail
Met Pro VCI	Fail	Fail	Fail
Met Pro VCI new formulation	Fail	Fail	Fail
VpCI-126	Pass	Pass	Pass
Zerust ROF	Fail	Fail	Fail
Control	Fail	Fail	Fail

VIA Test

Film	Plug #1	Plug #2	Plug #3
Armor	1	0	1
Daubert	1	2	2
Met Pro VCI	2	1	1
Met Pro VCI new formulation	3	2	1
VpCI-126	3	3	2
Zerust ROF	0	0	0
Control	0	0	0





FT-IR results are attached at the end of the report.

Conclusion:

1. The results determined that Armor Poly VCI SWS provided insufficient protection against corrosion. It failed the VIA test and the razor blade test on copper but passed the razor blade test for steel.(only contact inhibition for steel)
2. Daubert Premium Metal Guard exhibited inadequate anticorrosion properties. It inhibited contact corrosion for carbon steel but it failed to protect the copper panels and the Armor and Daubert films look very similar in the FT-IR spectra. The only difference - Daubert film additionally contains a desiccant. The film also contained nitrite.
3. Testing Met Pro VCI determined that it does not prevent corrosion. It failed the VIA test, and the copper and steel razor blades. The FT-IR results for this also show a desiccant was used in the film and the nitrite test determined that nitrite was present.
4. The test results determined that Met Pro VCI-new formulation barely passed the VCI test. However, it did not pass either the copper or the carbon steel razor blade. The FT-IR results showed that Met Pro VCI-new formulation possesses a desiccant. Although it helped to inhibit vapor phase corrosion, it did not prevent contact corrosion. Nitrite results were positive.
5. The results for VpCI-126 show that it is a good corrosion inhibitor. It prevents contact corrosion for carbon steel and copper while also inhibiting vapor phase corrosion.
6. Zerust ROF did not inhibit corrosion because it failed all of the corrosion tests but Zerust ROF. Based on FT-IR results this film contains an insufficient amount of corrosion inhibitors, if any.

Project #: 07-337-1125

VIA Test Grades (Grade 2 or 3 are passing)

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

