



- 4119 White Bear Parkway, St. Paul, MN 55110 USA
- Phone: (651) 429-1100, Fax: (651) 429-1122
- Toll Free: (800) 4-CORTEC, E-mail: info@cortecvci.com
- cortecvci.com • corteclaboratories.com

Comparing MetPro Film to VpCI-126

From: Cortec Laboratories, Inc.
4119 White Bear Parkway
St. Paul, MN 55110

cc: Boris Miksic
Cliff Cracauer
Ming Shen
Jay Zhang
Mike Gabor
Ivana Radic Borsic
Markus Bieber

Project #: 19-126-1125.bis

Results reported by:

A handwritten signature in black ink that reads "Brian Benduha".

Brian Benduha
Lab Technician

Results approved by:

A handwritten signature in blue ink that reads "John Wulterkens".

John Wulterkens
Technical Service Supervisor



Background: A sample of MetPro film was submitted for testing to determine the presence of VCI and to compare the corrosion protection compared to VpCI-126 film.

Sample Received: MetPro Film, 3mils received on 7-17-19 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
VpCI-126 film, 3mil (batch #410230)
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
MetPro Film	Fail	Fail	Fail	Fail
VpCI-126 Film*	Pass	Pass	Pass	Pass
Control	Fail	-	-	Fail

Razor Blade Test- Copper Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
MetPro 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
MetPro Film	Grade 0	Grade 0	Grade 0
VpCI-126 Film*	Grade 3	Grade 3	Grade 2
Control	Grade 0	-	-

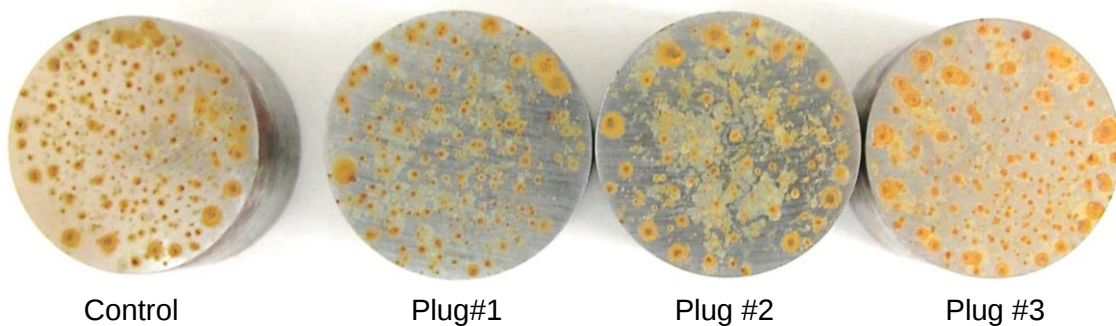
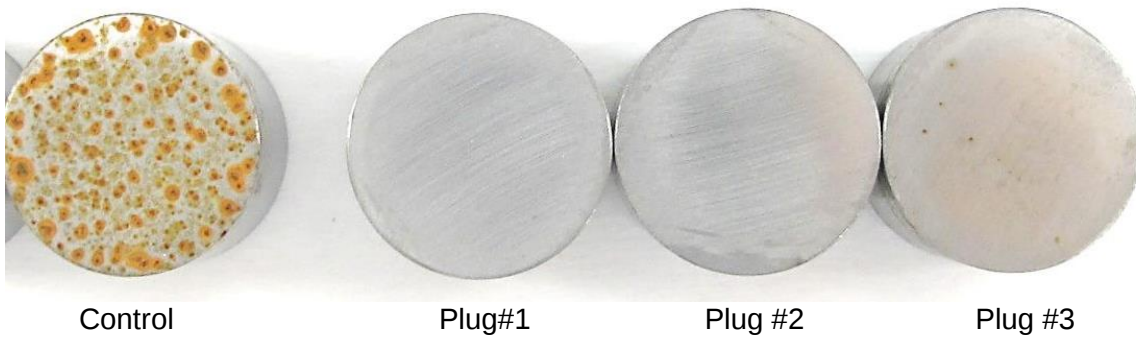
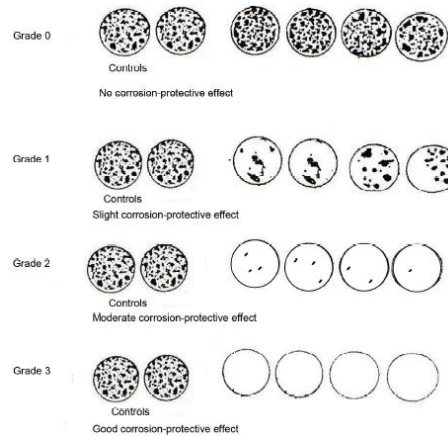
*Note- The razor blade and VIA results for VpCI-126 film were previously tested (from 16-083-1125)

Results:

The following results were found:

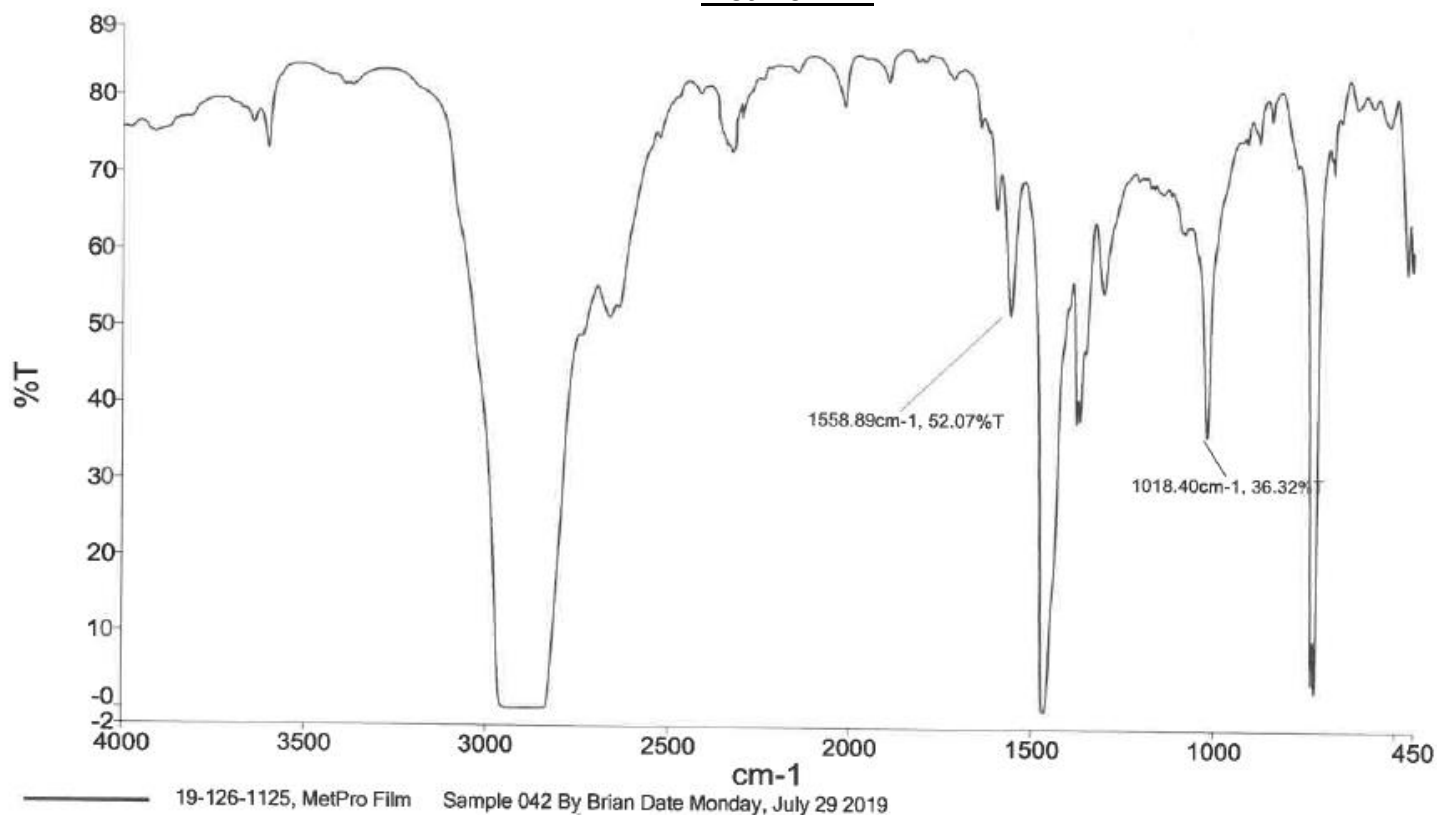
Nitrite/Nitrate Test Strips

Sample	Results
MetPro Film	Does not contain any nitrite/nitrate

Photo from the NACE VIA test:Metpro filmVpCI-126 film**VIA Test Grades**

FTIR Analysis:

MetPro Film



Interpretations:

Based on the FTIR analysis, the MetPro film appears to contain carboxylate type corrosion inhibitors based on the peak observed at $\sim 1559\text{ cm}^{-1}$. This film also appears to contain desiccant, based on the peak at 1018 cm^{-1} . However, based on the razor blade and VIA testing, the MetPro film provides very poor contact and vapor phase corrosion protection. In comparison, VpCI-126 film provides excellent contact and vapor phase corrosion protection.