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Evaluation of NTI Film for Customer

To: Jessica Carpenter-Glanz

For: Customer

From: Cortec Laboratories, Inc.
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cc: Boris Miksic
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Project #: 15-177-1125.bis

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Background: Customer manufactures automotive engines. They are currently packaging engines in both NTI and Cortec film. However, the engines packed in the NTI film are rusting. They would like Cortec Laboratories to test both NTI and Cortec film for corrosion protection properties.

Sample Received: Yellow NTI film, 4mils, received on 8/10/15 in dirty but acceptable condition.

Method: VIA Test, CC-027
 Razor Blade Test, CC-004*
 Nitrite/Nitrate Test*
**Cortec Laboratories, Inc is not ISO/IEC 17025 accredited for the test(s) marked.*

Materials: VIA test kit
 Razor blade test kit
 Nitrite/Nitrate Test Strips (lot #HC435784)
 VpCI-126 film, 4mil (batch #36225)
 Methanol (lot #041715D)
 Plain polyethylene film, 2mils (control film)

Procedure: The tests were conducted according to standard procedures for each test.

Results:

Razor Blade Test- Carbon Steel Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
NTI film	Pass	Pass	Pass	Pass
VpCI-126 film	Pass	Pass	Pass	Pass
Control	Fail	-	-	Fail

Razor Blade Test- Copper Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
NTI film	Pass	Pass	Pass	Pass
VpCI-126 film	Pass	Pass	Pass	Pass
Control	Fail	-	-	Fail

VIA Test

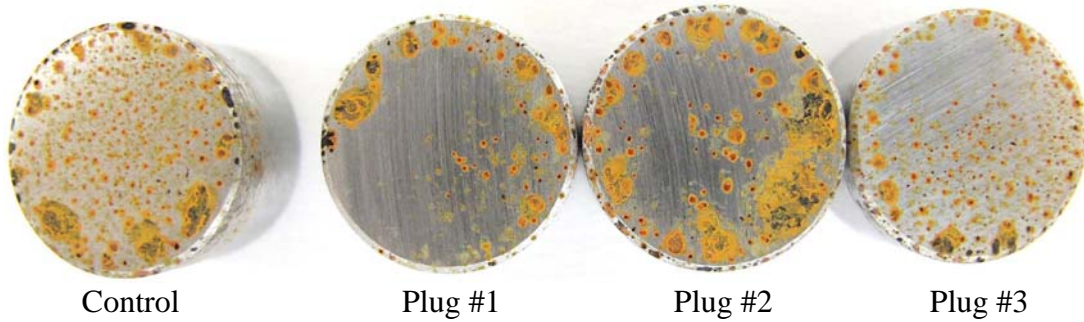
Sample	Plug #1	Plug #2	Plug #3	End Result
NTI film	Grade 1	Grade 0	Grade 1	Fail
VpCI-126 film	Grade 3	Grade 2	Grade 2	Pass
Control	Grade 0	-	-	Fail

Nitrite/Nitrate Test Strip Results

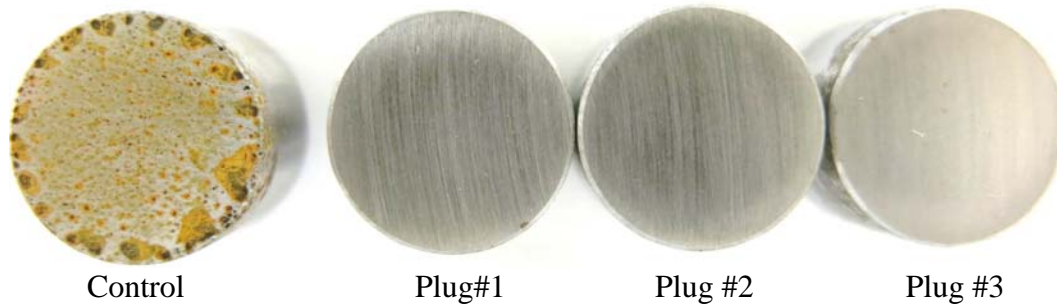
NTI Film contains nitrite and nitrate

Photos from VIA Testing:

NTI Film



Cortec's VpCI-126 film



VIA Test Grades (Grade 2 or 3 are passing)
All three plugs must be grade 2 or better to pass the test

		<p>Grade 0</p>
Grade 0:	Blind test No corrosion inhibiting effect	<p>Grade 1</p>
Grade 1:	Blind test Minute corrosion inhibiting effect	
Grade 2:	Blind test Medium corrosion inhibiting effect	<p>Grade 2</p>
Grade 3:	Blind test Good corrosion inhibiting effect	<p>Grade 3</p>

Interpretations: The NTI film provides adequate contact corrosion protection, but poor vapor phase protection. Cortec's VpCI-126 film provides both contact and vapor phase corrosion protection. These results verify what the customer has been seeing in their application.