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Evaluation for Customer Packaging

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cc: Boris Miksic
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Project #: 13-177-1125.bis

Results reported by: *Brian Benduha*
Brian Benduha
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Approved by: *M. Kharshan*
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Date: August 22, 2013



Background: Customer sent in two film samples and a sample of coated corrugated cardboard for testing. One of their customers is having corrosion issues with these products.

Sample Received: 1) Green Daubert Bag, 3 mils
2) Green Daubert Bag, 3 mils
3) Coated Corrugated Cardboard

Method: 1) VIA Test CC-027
2) Razor Blade Test CC-004*
3) Nitrite/Nitrate Test*
4) FTIR analysis
*Cortec Laboratory is not accredited for the test marked

Materials: 1) VIA test kit
2) Razor blade test kit
3) Nitrite/Nitrate Test Strips
4) Paragon 1000 FTIR

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

Results:

Razor Blade Test- Copper Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
Green Daubert Bag (1)	Fail	Fail	Fail	Fail
Green Daubert Bag (2)	Fail	Fail	Fail	Fail
Coated Corrugated Cardboard	Fail	Fail	Fail	Fail
Control	Fail	-	-	-

Razor Blade Test- Carbon Steel Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
Green Daubert Bag (1)	Fail	Fail	Pass	Fail
Green Daubert Bag (2)	Fail	Fail	Pass	Fail
Coated Corrugated Cardboard	Fail	Fail	Fail	Fail
Control	Fail	-	-	-

VIA Test

Sample	Plug #1	Plug #2	Plug #3	End Result
Green Daubert Bag (1)	Grade 2	Grade 1	Grade 0	Fail
Green Daubert Bag (2)	Grade 2	Grade 2	Grade 0	Fail
Coated Corrugated Cardboard	Grade 2	Grade 1	Grade 0	Fail
Control	Grade 0	-	-	-





The VIA grading system is attached to the end of the report

Nitrite Test Strips

Sample	Result
Green Daubert Bag (1)	Contains nitrite
Green Daubert Bag (2)	Contains nitrite
Coated Corrugated Cardboard	Does not contain nitrite

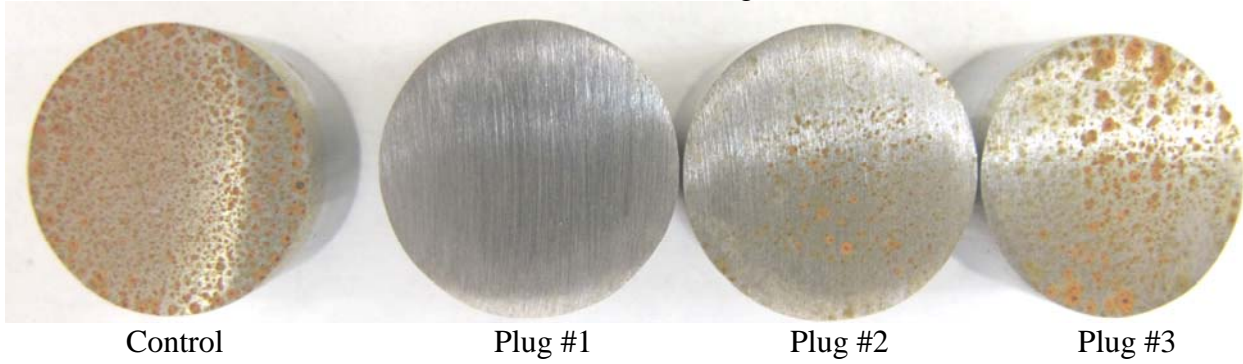
Interpretations: Both of the green Daubert bags and the sample of corrugated cardboard do not provide effective contact and vapor phase corrosion protection based on the razor blade and VIA testing.

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

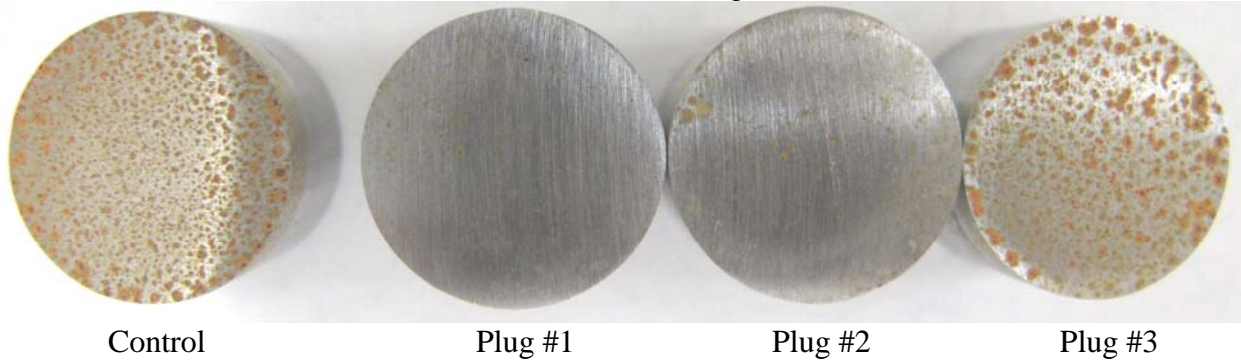
	 Grade 0
<p>Grade 0: Blind test No corrosion inhibiting effect</p>	 Grade 1
<p>Grade 1: Blind test Minute corrosion inhibiting effect</p>	 Grade 2
<p>Grade 2: Blind test Medium corrosion inhibiting effect</p>	 Grade 3
<p>Grade 3: Blind test Good corrosion inhibiting effect</p>	

Photos:

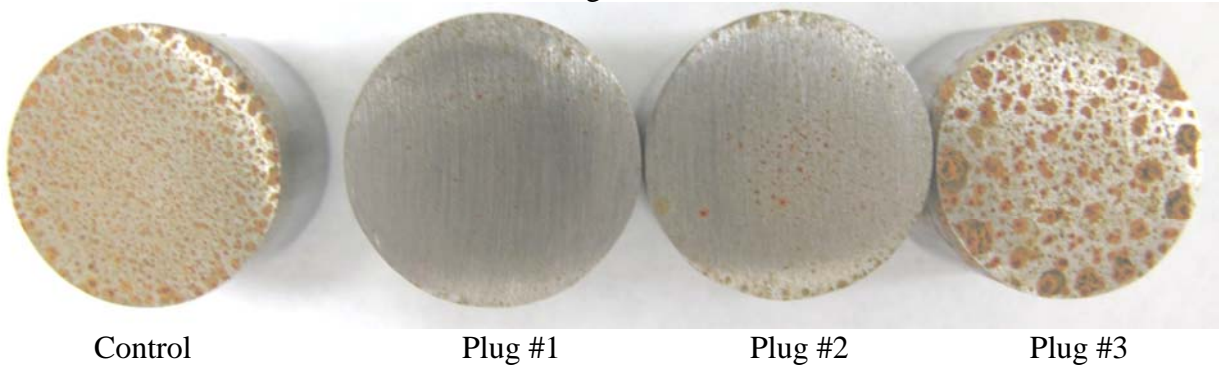
VIA Testing
Green Daubert Bag (1)



Green Daubert Bag (2)



Coated Corrugated Cardboard



FTIR Analysis

Green Daubert Bag (1 and 2)

