



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
Internet http://www.cortecvci.com

***Evaluation of Corrosion Protection of Daubert Cromwell Premium
Metal Guard and Unknown Film vs. VpCI-126***

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

cc: Boris Miksic
Anna Vignetti
Bob Boyle
Mike Morin

Project #: 10-155-1125(bis)

Test conducted by:

A handwritten signature in black ink that reads "Liz Austin".

Liz Austin
Sr. Lab Technician

Approved by:

A handwritten signature in black ink that reads "M. Kharshan" followed by a horizontal line.

Margarita Kharshan
Laboratory Director

Date: June 16, 2010



Background: Customer requested that the submitted Daubert Cromwell Premium Metal Guard and VCI Blue film (unknown manufacturer) be tested to determine if they provide corrosion protection.

Sample Received: 08/11/10

Sample(s) labeled:

1. VCI Blue film, unknown manufacturer, 1.7 mil
2. Daubert Cromwell Premium Metal-Guard, 4 mil

Method:

1. VIA test
2. Razor Blade Test
3. FTIR

Materials:

1. VpCI-126, 1.5 mil
2. Razor Blade test kit
3. VIA test kit

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

Results:

Razor Blade Test Performed on Carbon Steel Panels

Sample	Panel 1	Panel 2	Panel 3
Daubert Cromwell Premium Metal Guard	Pass	Pass	Pass
VCI Blue film	Fail	Fail	Fail
VpCI-126, 1.5 mil	Pass	Pass	Pass
Control	Fail	-	-

Razor Blade Test Performed on Copper Panels

Sample	Panel 1	Panel 2	Panel 3
Daubert Cromwell Premium Metal Guard	Pass	Fail	Fail
VCI Blue film	Fail	Fail	Fail
VpCI-126, 1.5 mil	Pass	Pass	Pass
Control	Pass	-	-

VIA Test

Note: VIA Grading system is attached below

Sample	Plug #1	Plug #2	Plug #3
Daubert Cromwell Premium Metal Guard	Grade 0	Grade 1	Grade 1
VCI Blue film	Grade 0	Grade 1	Grade 2
VpCI-126, 1.5 mils	Grade 3	Grade 3	Grade 2
Control	Grade 0	-	-

FTIR Results

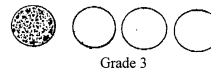
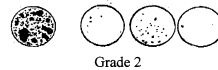
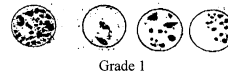
FTIR results are attached at the end of the report.

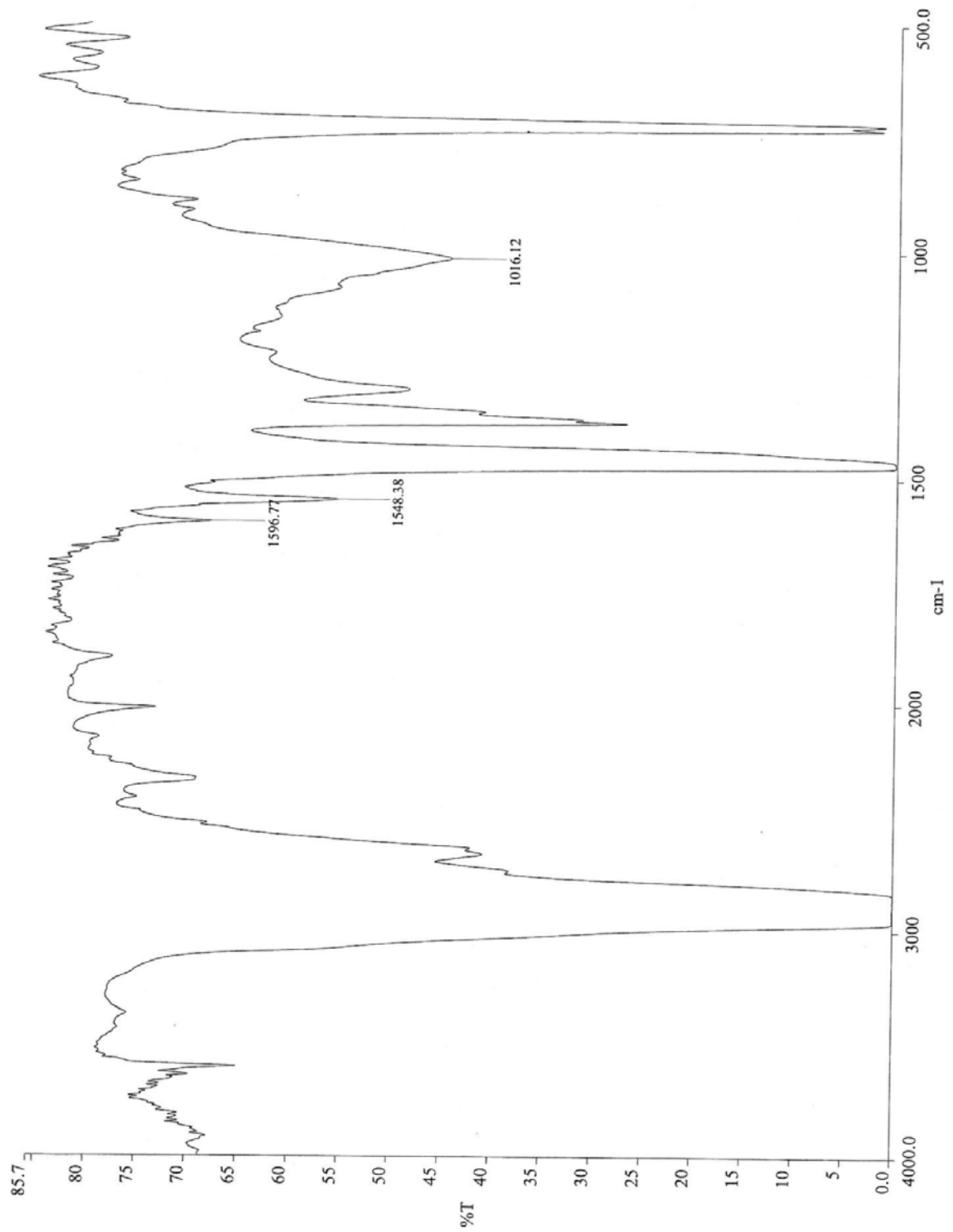
Interpretations:

1. Based on the test results, Daubert Cromwell Premium Metal Guard provides contact-phase corrosion protection for carbon steel, but does not protect copper. In addition, the VIA test results indicate that it provides insufficient vapor-phase corrosion inhibition, if any.
2. The VCI blue film, produced by an unknown manufacturer, did not provide contact-phase protection for carbon steel or copper, and it failed to provide sufficient vapor-phase corrosion protection.
3. Based on the test results, The VpCI-126, 1.5 mil provided sufficient contact and vapor-phase corrosion protection.

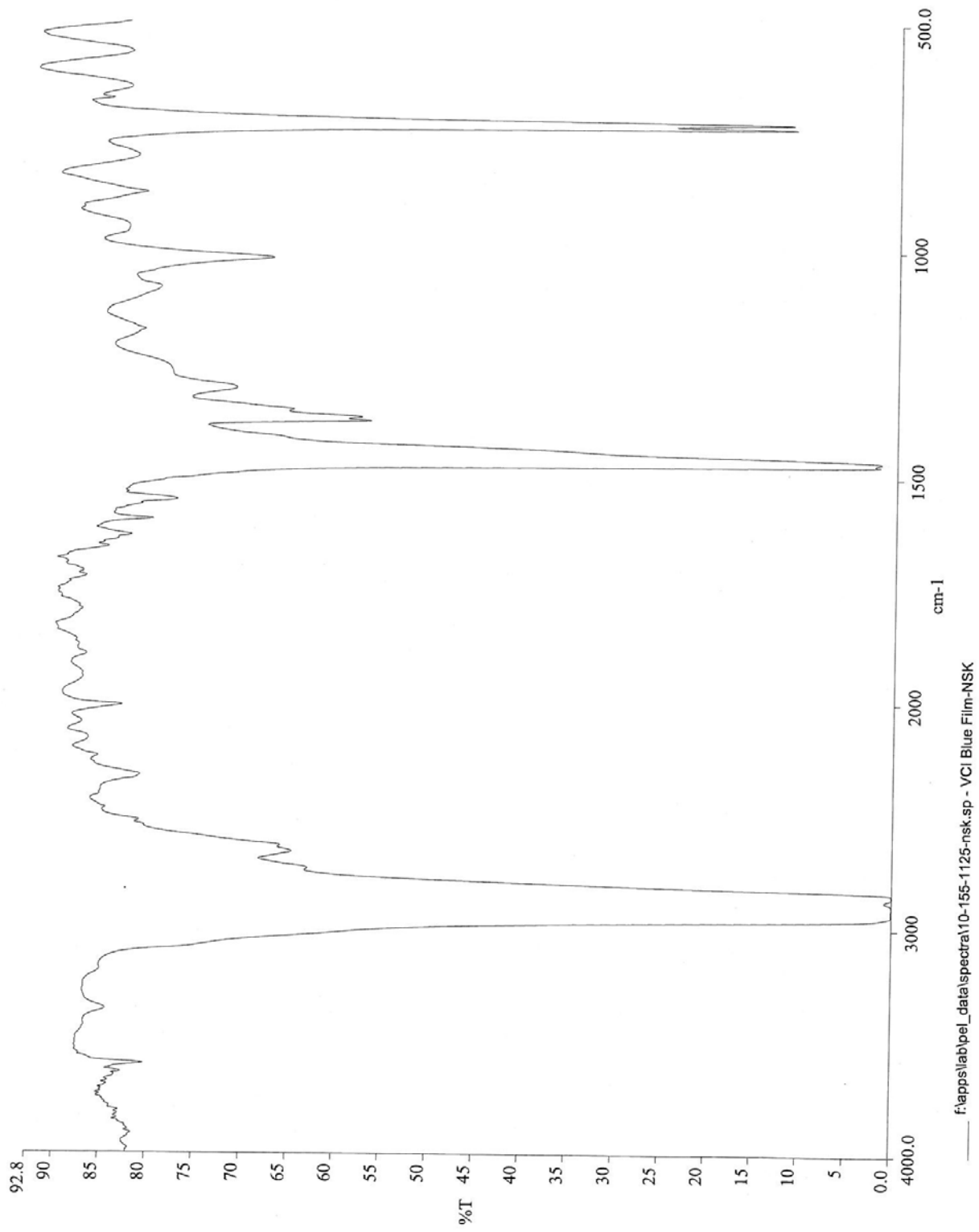
VIA Test Grades (Grade 2 or 3 are passing)

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

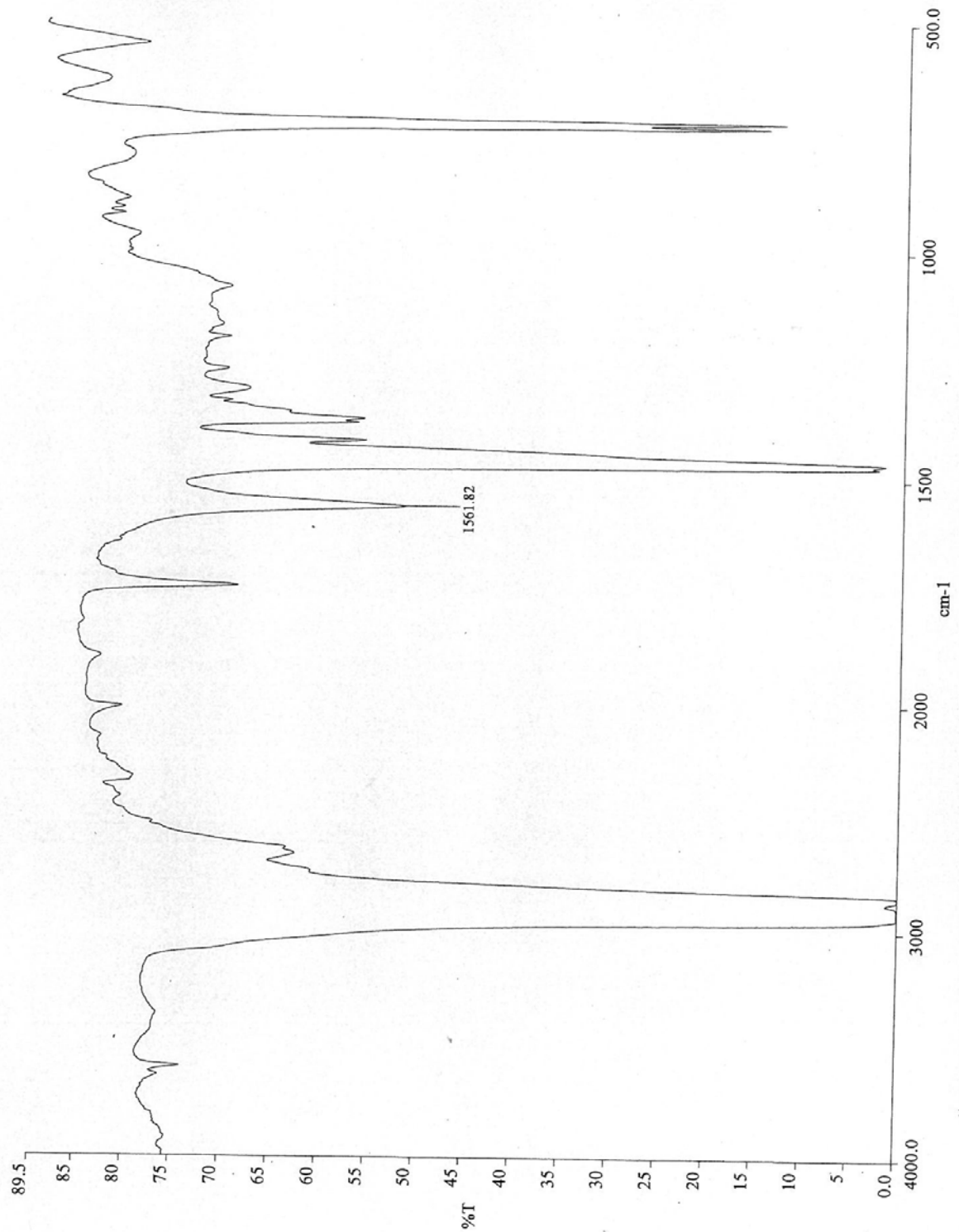




f:\apps\leblpel_data\spectra\10-155-1125-dc.sp - Daubert Cromwell Premium Metal-Guard



f:\apps\lab\pel_data\spectra\10-155-1125-nsk.sp - VCI Blue Film-NSK



f:\apps\lab\pel_data\spectra\10-155-1125-126.sp - VpCl-126 1.5 mil