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LABORATORY ACCREDITATION BUREAU
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Certificate # L2267 Testing

# *Evaluation of DesiChem VCI film vs. VpCI-126*

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**Date:** December 15, 2011

**Project** #:11-258-1125(bis)

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**Background:** It was requested that the corrosion protection and mechanical properties of the submitted DesiChem film be evaluated and compared to VpCI-126

**Sample Received:**

1) Blue DesiChem film from customer, good condition, received 12-07-11

**Method:**

1) VIA Test CC-027
2) Razor Blade Test CC-004*
3) FTIR Test CC-006
4) Mechanical Properties: Performed at Cambridge:
    1) Breaking Factor, ASTM D882-02*
    2) Tensile Strength at Break, Yield Strength, and Elongation at Break, ASTM D882-02*
    3) Puncture Resistance, MIL-STD-3010, TM 2065*
    4) Tear Strength, ASTM D1922-06a*

*Cortec Laboratory is not accredited for the test marked

**Materials:**

1) VIA test kit
2) Razor Blade test kit
3) Perkin Elmer Paragon 1000 Spectrophotometer
4) VpCI-126 Lot#30688

**Procedure:**

1) The tests were performed according to standard procedures.

**Results:**

**Razor Blade Carbon Steel**

| Sample | Panel 1 | Panel 2 | Panel 3 |
|---|---|---|---|
| DesiChem | Fail | Fail | fail |
| VpCI-126 | Pass | Pass | Pass |
| Control | Fail | - | - |

**Razor Blade Copper**

| Sample | Panel 1 | Panel 2 | Panel 3 |
|---|---|---|---|
| DesiChem | Fail | Fail | Fail |
| VpCI-126 | Pass | Pass | Pass |
| Control | Fail | - | - |


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**VIA Test Results**

| Sample | Plug #1 | Plug #2 | Plug #3 |
|---|---|---|---|
| DesiChem | Grade 1 | Grade 0 | Grade 0 |
| VpCI-126 | Grade 3 | Grade 3 | Grade 2 |
| Control | Grade 0 | - | - |

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

**Mechanical Properties**

| Property | | Test Method | Units | DesiChem Test 1 | DesiChem Test 2 | DesiChem Average | VpCI-126 |
|---|---|---|---|---|---|---|---|
| Caliper | | ASTM D6988 | mil | 2.81 | 3.40 | 3.10 | 3.5 |
| Breaking Factor | MD | ASTM D882-02 | lbs/in | 10.91 | 11.59 | 11.25 | 19.87 |
| Breaking Factor | TD | ASTM D882-02 | lbs/in | 12.12 | 12.08 | 12.10 | 19.07 |
| Tensile Strength at Break | MD | ASTM D882-02 | psi | 2870.20 | 3081.51 | 2975.86 | 4188.43 |
| Tensile Strength at Break | TD | ASTM D882-02 | psi | 3075.20 | 2940.33 | 3007.77 | 4139.95 |
| Elongation at Break | MD | ASTM D882-02 | % | 9.38 | 10.19 | 9.79 | 796.98 |
| Elongation at Break | TD | ASTM D882-02 | % | 14.61 | 14.14 | 14.38 | 846.26 |
| Yield Strength | MD | ASTM D882-02 | psi | 1500.88 | 1497.29 | 1499.09 | 1332.59 |
| Yield Strength | CD | ASTM D882-02 | psi | 1626.94 | 1590.18 | 1608.56 | 1555.95 |
| Puncture Resistance | | MIL-STD-3010, TM 2065 | lbf | 5.48 | 5.98 | 5.73 | 5.09 |
| Tear Strength | MD | ASTM D1922-06a | mN | 3029.33 | 3578.69 | 3304.01 | 7188.77 |
| Tear Strength | CD | ASTM D1922-06a | mN | 5901.70 | 5619.17 | 5760.44 | 12745.16 |

*Typical properties represent average laboratory values and are not intended as specifications but as guides only.

**Interpretations:**

1) Based on the VIA and razorblade test results, the DesiChem film did not provide corrosion protection, in vapor or contact-phase. The FTIR results indicated there was not a sufficient amount of inhibitor, if any.
2) The results determined that VpCI-126 provided sufficient corrosion protection.
3) The mechanical properties results of the two films determined that VpCI-126 has a higher breaking factor, greater tensile strength at break, greater elongation at break, and higher tear strength. The yield strength and the puncture resistance were similar between the VpCI-126 and DesiChem.


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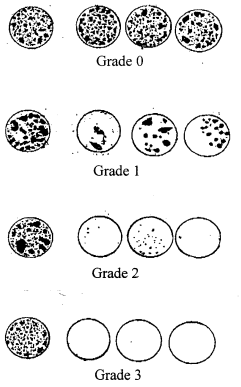
**VIA Test Grades (Grade 2 or 3 are passing)**

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





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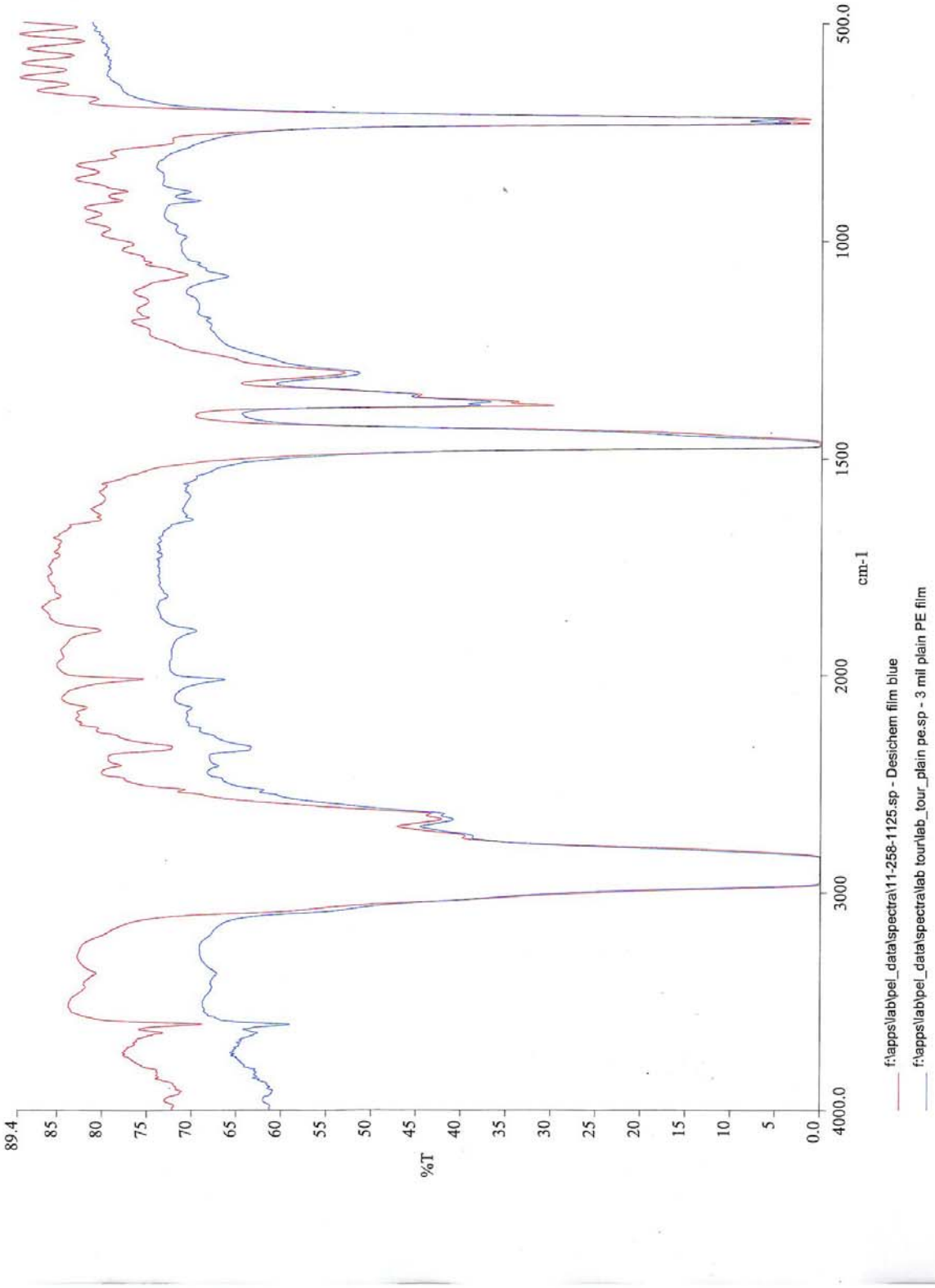



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