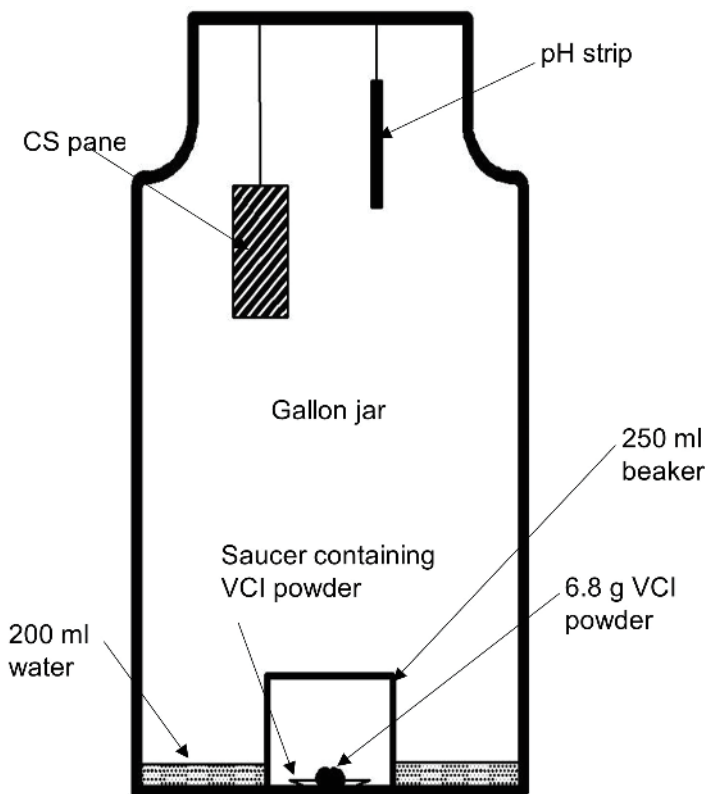




NEWS ALERT

Long-Term Efficacy Evaluation of VCI Powders in High Humidity Applications for Four Years



There are many reasons a company may need to lay up a piece of equipment long term (more than two years) and would like to minimize the number of preservation material applications required to achieve the desired length of protection. VCI powder, the purest form of VCI inhibitor, has been used for years to protect internal void spaces from corrosion. However, from time to time, Cortec® has received requests from potential customers for proof that VCI powder can indeed protect long term, questioning if VCI powder will lose its efficacy when continuously exposed to humidity or if VCI powder will turn acidic over time.

This investigation evaluated two VCI powders for more than four years in a humid sealed environment. It demonstrated that the VCI powders provided long-term protection with a single application and that VCI powders did not generate acidic vapor when exposed to moisture continuously.

Two different powders, VpCI®-609 and VmCI 307®, were evaluated in the configuration illustrated (at left) at a dosage rate of 1.5 oz./ft³ (1752 g/m³). Each test jar was tightly sealed (tape affixed tightly around the lid sealing it to the jar). Even so, there was some leakage as indicated by gradual loss of water at the bottom of the jar. After approximately two years, additional water was added to maintain the initial water level in the jar.

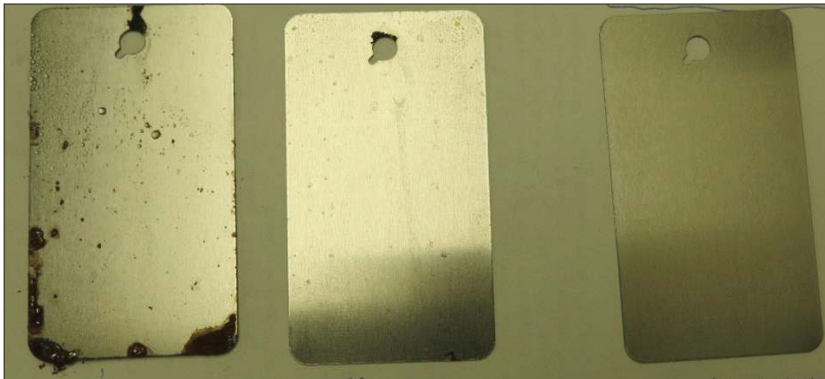
The evaluation lasted more than four-and-a-half years (February 2016 – November 2020) in an enclosed humid environment as illustrated in the diagram, where a carbon steel panel (C1010) was suspended in the vapor space. Testing was conducted at 104 °F (40 °C) from February 2016 to February 2019, and then continued at room temperature from February 2019 to November

Cortec® Corporation is the global leader in innovative, environmentally responsible VpCI® and MCI® corrosion control technologies for the Packaging, Metalworking, Construction, Electronics, Water Treatment, Oil & Gas, and other industries. Headquartered in St. Paul, Minnesota, Cortec® manufactures over 400 products distributed worldwide. ISO 9001 and ISO 14001 Certified, and ISO 17025 Accredited.





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Control

VmCI 307®

VpCI®-609
(side 1)

Control

VmCI 307®

VpCI®-609
(side 2)

VmCI 307®

VpCI®-609

2020. Condensation was obvious on interior walls and on the carbon steel panel throughout the testing.

Results (November 2020)

- Carbon Steel Corrosion Coupon
 - VpCI®-609: No visual evidence of corrosion.
 - VmCI 307®: Minor corrosion spots on edges (minor corrosion spots within 1/8" [3 mm] of the edges are usually ignored in humidity testing).
- pH in the Vapor Space Indicated by pH Paper (Litmus)
 - VpCI®-609: pH reading varied from pH 9 (during the first year of 2016) to pH 7 for the duration of the test.
 - VmCI 307®: Maintained a pH of 7 throughout the test.
 - This demonstrated that VpCI®-609 and VmCI 307® did not turn the Vapor phase Corrosion Inhibitors acidic in the continued presence of moisture in a reasonably well-enclosed space.
- Physical State of VpCI®-609 and VmCI 307® After Being in Continuous Humidity for Four-and-a-Half Years
 - In an enclosed environment with high humidity both powders turned to a liquid in several weeks.
 - Efficacy remained constant for the four-and-a-half-year test.

Conclusion

Both powders, VpCI®-609, and VmCI 307®, demonstrated the ability to provide corrosion protection to carbon steel for over four years in an enclosed environment with continuous high humidity.

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