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Analysis of Four Oil Based Rust Preventatives

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Background: A customer wants to compare two oil based rust preventatives to VpCI-329D and VpCI-325 in humidity testing with their steel panels.

Sample Received:

- One bottle (approximately 300 mL) of Quaker Ferrocoate 61 MAL HCL 1
- One bottle (approximately 300 mL) of Henkel Pennsteel 100
- Four steel panels (11.5 cm x 22 cm)

Method: ASTM D-1748 (120°F, ~99% relative humidity)

Materials: Steel Panels
Henkel Pennsteel 100
Quaker Ferrocoate 61 MAL HCL 1
VpCI-414
VpCI-329 D
VpCI-325

Procedure: The following procedure was used:

- 1) Clean all 5 steel panels with VpCI-414 and let dry.
- 2) Set one panel aside to not be treated (Control).
- 3) Coat the last 4 panels each with a different rust preventative:
 - a. VpCI-329 D
 - b. Henkel Pennsteel 100
 - c. Quaker Ferrocoate 61 MAL HCL 1
 - d. VpCI-325
- 4) Label all 5 of the panels and hang in ASTM D-1748 humidity cabinet.
- 5) Monitor the panels daily to check for visual corrosion.
- 6) Remove the panels after the last failure time and take photos to compare amounts of corrosion.

Results: The following results were found:

ASTM D-1748 Humidity

Rust Preventative	Time to Failure (Hours)
None (Control)	24
Quaker Ferrocoate 61 MAL HCL 1	216
VpCI-329 D	384
Henkel Pennsteel 100	432
VpCI-325	648

Interpretations:

The best rust preventative according to this test was VpCI-325 in both failure time and analysis of the panels from after test completion. Henkel Pennsteel 100 had the next longest protection; however, the panel developed significantly more rust between its failure time of 432 hours and test completion time of 648 hours. VpCI-329 failed 48 hours before Henkel Pennsteel 100, but it had minimal additional corrosion before test completion. Quaker Ferrocote 61 MAL HCL 1 performed the worst, looking similar to the control after 648 hours of humidity testing.

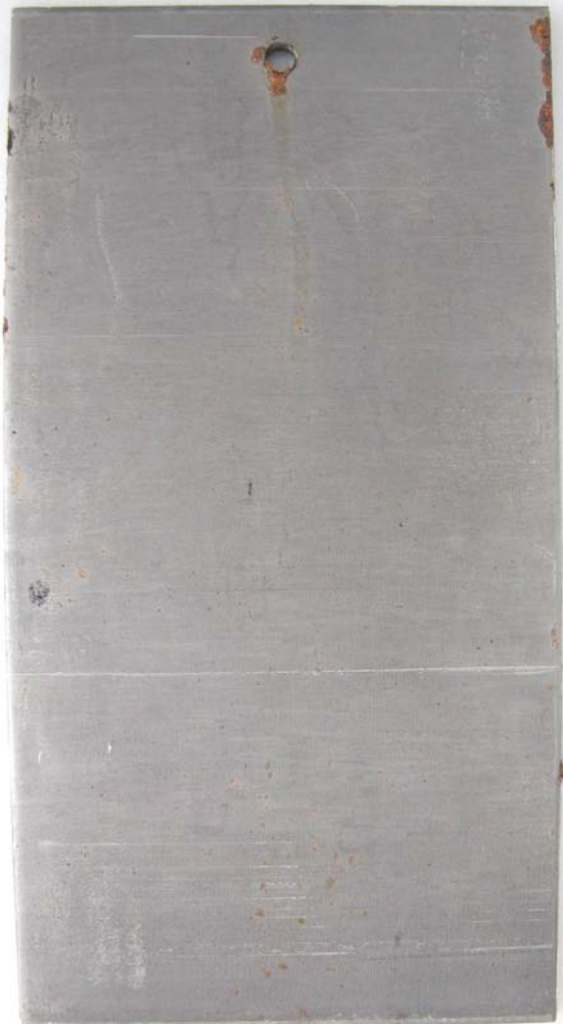
Photos:

The following were taken after 648 hours in the humidity chamber:

Note: Some of the panels had black staining on before the test was conducted. This likely occurred when the panels had holes drilled on the top section for hanging in the humidity chamber. This was most evident on the VpCI-325 and Quaker (bottom right) panels.



VpCI-325



VpCI-329



Quaker



Henkel



Control