Sample Identification:  Salt Spray Testing of Coated Panels

Objective:  We were requested to expose eight (8) groups of coated panels to a salt fog environment per ASTM B117-18 until milestones of 10-15% white corrosion and 10-15% red corrosion were achieved.

Summary:  The test panels were inspected for white and red corrosion after every 24 hours (weekends excluded).

HDG G30 with InterCoat ChemGuard withstood longer exposure to red rust when compared against various heavy metallic zinc coating weights, such as those specified on HDG G90 to G235, even when coated with a hexavalent chromium passivation. HDG G30 with InterCoat ChemGuard also withstood longer exposure to red rust when compared against (Galvalume with Thin-Film Acrylic). All test samples were in the same salt spray testing chamber simultaneously.

The following table contains the results of those examinations:

<table>
<thead>
<tr>
<th>Substrate</th>
<th>Zn Class</th>
<th>Coating</th>
<th>Ct Weight</th>
<th>10-15% White</th>
<th>10-15% Red</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDG</td>
<td>G30</td>
<td>CG315L</td>
<td>100-150</td>
<td>336 Hours</td>
<td>672 Hours</td>
</tr>
<tr>
<td>HDG</td>
<td>G30</td>
<td>CG315L</td>
<td>250-300</td>
<td>N/A*</td>
<td>1,800 Hours</td>
</tr>
<tr>
<td>HDG</td>
<td>G40</td>
<td>Chemtreat</td>
<td>3.5</td>
<td>144 Hours</td>
<td>240 Hours</td>
</tr>
<tr>
<td>HDG</td>
<td>G90</td>
<td>Chemtreat</td>
<td>0.3</td>
<td>24 Hours</td>
<td>408 Hours</td>
</tr>
<tr>
<td>HDG</td>
<td>G115</td>
<td>Chemtreat</td>
<td>2.9</td>
<td>144 Hours</td>
<td>1,200 Hours</td>
</tr>
<tr>
<td>HDG</td>
<td>G235</td>
<td>Chemtreat</td>
<td>2.2</td>
<td>144 Hours</td>
<td>1,368 Hours</td>
</tr>
<tr>
<td>AZ</td>
<td>50</td>
<td>Galvalume-Plus</td>
<td>75-125mg</td>
<td>1,368 Hours</td>
<td>1,704 Hours</td>
</tr>
<tr>
<td>AZ</td>
<td>55</td>
<td>Galvalume-Plus</td>
<td>75-125mg</td>
<td>1,368 Hours</td>
<td>1,704 Hours</td>
</tr>
</tbody>
</table>

*Panel group HDG G30-CG315L-250-300mg/ft² did not exhibit 10-15% white corrosion prior to the red corrosion milestone
Procedures and Data: The conditions inside the chamber were as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution</td>
<td>5% NaCl</td>
</tr>
<tr>
<td>Chamber Temperature</td>
<td>95 ± 1°F</td>
</tr>
<tr>
<td>Specific Gravity @ 95 °F</td>
<td>1.025 to 1.040</td>
</tr>
<tr>
<td>pH of Collected Solution</td>
<td>6.5 to 7.2</td>
</tr>
<tr>
<td>Average Collection Rate</td>
<td>1-2 ml/hr./80 cm²</td>
</tr>
</tbody>
</table>

Per the requirements of ASTM B117-18, the test panels were placed at an angle of approximately 15° to 30° from the vertical. Images were taken of the panels prior to the exposure period and at each observed milestone (See Images #1-23).

Anderson Laboratories, Inc.

Ben Cardenas
Laboratory Analyst - Chemical Testing

Lori Felber
Quality Assurance Manager

Chemcoaters, LLC  C416
HDG G30 CG315L, 100-150
Hours of Exposure: 0
Image #1

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G30 CG315L, 100-150
Hours of Exposure: 336
Image #2

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G30 CG315L, 100-150
Hours of Exposure: 672
Image #3

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G30-CG315L-250-300mg/ft²
Hours of Exposure: 0
Image #4

Magnification: 0.5X
Chemcoaters, LLC C416
HDG G30-CG315L-250-300mg/ft²
Hours of Exposure: 1,800
Image #5

Magnification: 0.6X
Chemcoaters, LLC  C416
HDG G40 Chemtreat Cr=3.5
Hours of Exposure:  0
Image #6

Magnification:  0.4X
Chemcoaters, LLC  C416
HDG G40 Chemtreat Cr=3.5
Hours of Exposure: 144
Image #7

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G40 Chemtreat Cr=3.5
Hours of Exposure: 240
Image #8

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G90 Chemtreat Cr=0.3
Hours of Exposure: 0
Image #9

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G90 Chemtreat Cr=0.3
Hours of Exposure: 24
Image #10

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G90 Chemtreat Cr=0.3
Hours of Exposure: 408
Image #11

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G115 Chemtreat Cr=2.9
Hours of Exposure: 0
Image #12

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G115 Chemtreat Cr=2.9
Hours of Exposure: 144
Image #13

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G115 Chemtreat Cr=2.9
Hours of Exposure: 1,200
Image #14

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G235 Chemtreat Cr=2.2
Hours of Exposure: 0
Image #15

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G235 Chemtreat Cr=2.2
Hours of Exposure: 144
Image #16

Magnification: 0.4X
Chemcoaters, LLC  C416
HDG G235 Chemtreat Cr=2.2
Hours of Exposure: 1,368
Image #17

Magnification: 0.4X
Chemcoaters, LLC  C416
AZ50 Galvalume-Plus 75-125
Hours of Exposure: 0
Image #18

Magnification: 0.4X
Chemcoaters, LLC  C416
AZ50 Galvalume-Plus 75-125
Hours of Exposure: 1,368
Image #19

Magnification: 0.4X
Chemcoaters, LLC  C416
AZ50 Galvalume-Plus 75-125
Hours of Exposure: 1,704
Image #20

Magnification: 0.4X
Chemcoaters, LLC  C416
AZ55 Galvalume-Plus 75-125
Hours of Exposure: 0
Image #21

Magnification: 0.4X
Chemcoaters, LLC  C416
AZ55 Galvalume-Plus 75-125
Hours of Exposure: 1,368
Image #22

Magnification: 0.4X
Chemcoaters, LLC  C416
AZ55 Galvalume-Plus 75-125
Hours of Exposure: 1,704
Image #23

Magnification: 0.4X