Comparative Testing of MCI-2005, Gulf Sail’s CMCI-205 and Surtreat’s TPS-V

**Background:** Gulf Sail’s CMCI-205 and Surtreat’s TPS-V are competing against MCI-2005 in the Middle East.

**Purpose:** To compare the performance of MCI-2005 vs. competitor products.

**Materials:** Carbon Steel Panels (SAE 1010)
MCI-2005
Gulf Sail Factory L.L.C. CMCI-205
Surtreat TPS-V (Gulf Concreting Products)
Mettler Toledo SevenMulti pH/Ion Meter
ASTM D 1475 Cup for measuring WPG
Glass Jars

**Methods:** Non Volatile Content (NVC)
pH
Weight Per Gallon (WPG)
Full Immersion Test

**Procedures:** Non Volatile Content:
1. Weight sample and place in 120°F oven for 20 minutes.
2. Take sample out of oven and weigh it again.
3. Calculate NVC.

           pH:
1. Dip pH sensitive electrode into undiluted solutions and read pH value.

   Weight Per Gallon:
1. Weigh empty test cup and then fill with test solution.
2. Weigh full test cup.
3. Calculate WPG.
Full Immersion Test:
1. Immerse 1010 Carbon Steel Panels in a simulated porous solution of concrete contaminated with chlorides. The solution was saturated with calcium hydroxide and contained 3.5wt% NaCl.
2. Jars were kept in 40°C oven for 8 days.
3. Removed and photographed panels.

Results: Non Volatile Content (NVC), pH, and Weight Per Gallon (WPG)

<table>
<thead>
<tr>
<th>Material</th>
<th>pH</th>
<th>NVC</th>
<th>WPG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cortec’s MCI-2005</td>
<td>8.5-9.3</td>
<td>44-50</td>
<td>9.5-10.3</td>
</tr>
<tr>
<td>Gulf Sail’s CMCI 205</td>
<td>13.2</td>
<td>28</td>
<td>10.1</td>
</tr>
<tr>
<td>Surtreat’s TPS-V</td>
<td>6.4</td>
<td>0</td>
<td>8.4</td>
</tr>
</tbody>
</table>

Full Immersion Test:

<table>
<thead>
<tr>
<th>Material</th>
<th>Time before corrosion (hours)</th>
<th>Type of corrosion</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3.5% NaCl +Ca(OH)₂ pH 12.5 + 0.5wt% MCI-2005)</td>
<td>&gt;192</td>
<td>---</td>
</tr>
<tr>
<td>(3.5% NaCl +Ca(OH)₂ pH 12.5 + 0.5wt% CMCI-205)</td>
<td>&lt;24</td>
<td>Local/Pitting</td>
</tr>
<tr>
<td>(3.5% NaCl +Ca(OH)₂ pH 12.5 + 0.5wt% TPS-V)</td>
<td>&lt;24</td>
<td>Local/Pitting</td>
</tr>
<tr>
<td>Control (3.5% NaCl +Ca(OH)₂ pH 12.5)</td>
<td>&lt;24</td>
<td>Local/Pitting</td>
</tr>
</tbody>
</table>
Conclusion:

1. According to the corrosion test results, the addition of CMCI-205 or TPS-V to the simulated porous solution does not diminish the corrosiveness of it. At the same time, the addition of MCI-2005 eliminates the possibility of local/pitting corrosion caused by chloride ions.
2. CMCI-205 has a NVC that is two times lower than MCI-2005.
3. CMCI-205 has a pH level that is hazardous.

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