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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:

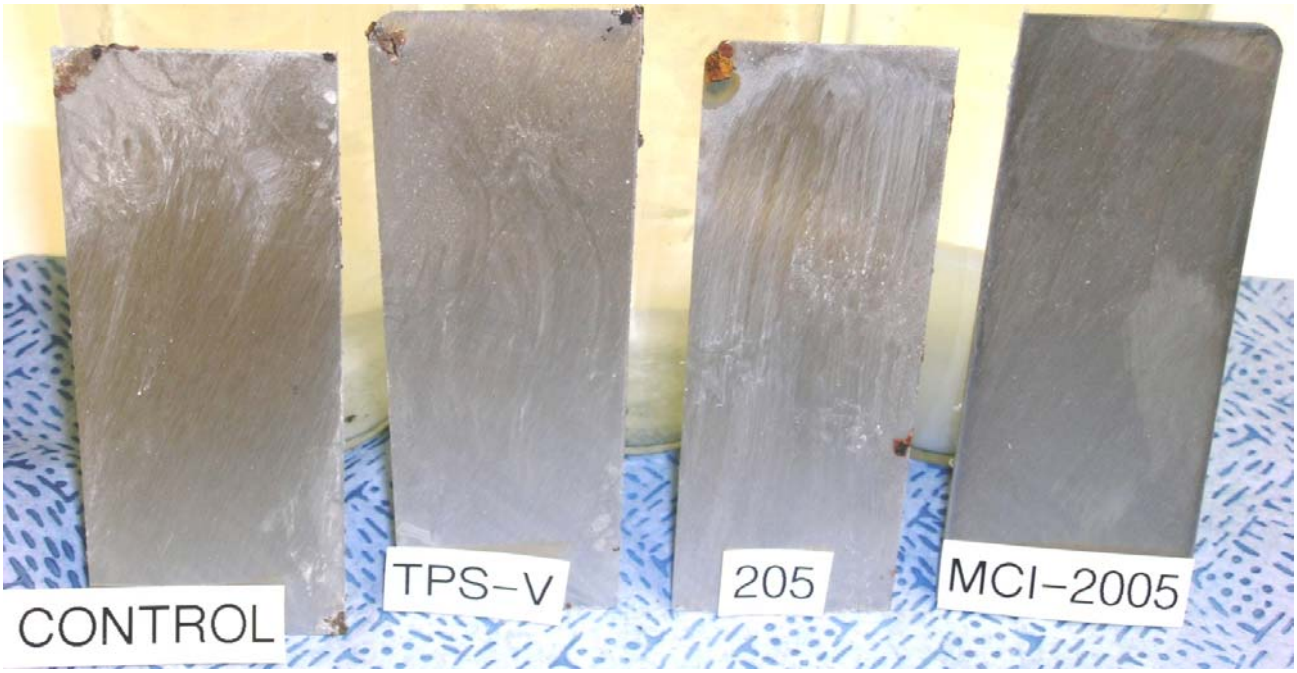
1. Immerse 1010 Carbon Steel Panels in a simulated porous solution of concrete contaminated with chlorides. The solution was saturated with calcium hydroxide and contained 3.5wt% NaCl.
2. Jars were kept in 40°C oven for 8 days.
3. Removed and photographed panels.

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

Material	pH	NVC	WPG
Cortec's MCI-2005	8.5-9.3	44-50	9.5-10.3
Gulf Sail's CMCI 205	13.2	28	10.1
Surtreat's TPS-V	6.4	0	8.4

Full Immersion Test:

Material	Time before corrosion (hours)	Type of corrosion
(3.5% NaCl +$Ca(OH)_2$) pH 12.5 + 0.5wt% MCI-2005	>192	---
(3.5% NaCl +$Ca(OH)_2$) pH 12.5 + 0.5wt% CMCI-205	<24	Local/Pitting
(3.5% NaCl +$Ca(OH)_2$) pH 12.5 + 0.5wt% TPS-V	<24	Local/Pitting
Control (3.5% NaCl +$Ca(OH)_2$) pH 12.5	<24	Local/Pitting



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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