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***Corrosion Protection of MCI and DCI in Simulated Porous
Solution the Presence of Chlorides***

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Background: Customer wants to compare corrosion protection of the rebars provided by DCI used at the recommended dosage and MCI in the presence of Chlorides

Method:

- 1) Immersion test

Materials:

- 1) Carbone Steel Panels (SAE 1010)
- 2) MCI 2005 batch #17502
- 3) DCI material
- 4) Sodium Chloride and Calcium Hydroxide lab. grade

Procedure:

1. Simulated porous solutions were prepared by dissolving in Deionized water:
 - a) 4g/l Ca(OH)_2 + 0.5% NaCl
 - b) 4g/l Ca(OH)_2 + 1% NaCl
 - c) 4g/l Ca(OH)_2 + 1.5% NaCl
2. MCI 2005 was added to these solutions based on the ratio 1 pint per cubic yard (4.4 ml per liter) DCI was added based on the ratio 0.5 gal per cubic yard (17.5 ml per liter).
3. Steel panel were cleaned with Methanol, air dried and immersed in mentioned above solution.
4. Test was performed in sealed jars at 40 C. The duration of the test was 48 hours.
5. Tested panels were removed from solutions and photographed.

Results:

Table 1.

Solutions	Control	DCI	MCI 2005
4g/l Ca(OH)_2 + 0.5% NaCl	Corr.	No vis. Corr.	No vis. Corr.
4g/l Ca(OH)_2 + 1% NaCl	Corr.	Corr.	No vis. Corr.
4g/l Ca(OH)_2 + 1.5% NaCl	Corr.	Corr.	No vis. Corr.

Interpretations:

1. Tested simulated porous solutions (controls) cause local corrosion of carbon steel.
2. Addition of MCI 2005 at the dose rate 4.4 ml/liter solution protects steel from corrosion in all tested simulated porous solutions with added NaCl in different concentration.
3. Addition of DCI at the dose rate 17.5 ml per liter solution protects steel from corrosion at 0.5% NaCl in simulated porous solution; DCI added to any greater levels of NaCl doesn't prevent corrosion on steel.
4. MCI 2005 added in ~ 4 times lower concentration than DCI out performs the last one in protection ability when tested in simulated porous solutions.

Photos:



