

# DTEA II<sup>TM</sup> CHEMISTRY

## LABORATORY CLOSED LOOP EVALUATION

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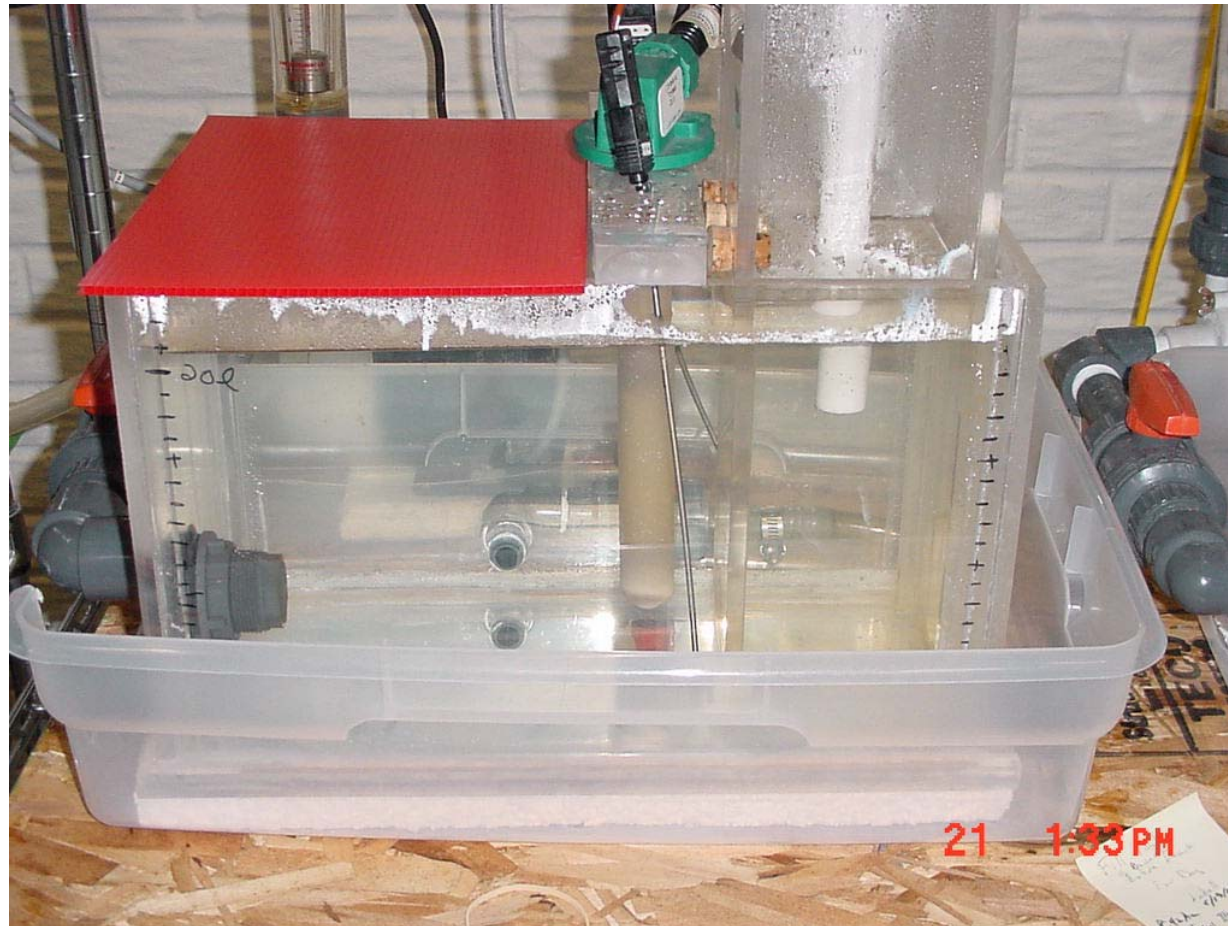


# Objectives

- To Demonstrate Benefit of DTEA II™ Chemistry to a Traditional Corrosion Inhibitor Program
- To evaluate the corrosion performance of AMSA DTEA II™ chemistry with Organo-Phosphonate in a closed loop environment
- Evaluate the dosage response of DTEA II™ with Organo-Phosphonate
- Corrosion profile of DTEA II™ is based on linear polarization resistance technique
- Confirm Field and Customer Experiences



# Tank Used for Closed Loop Evaluations



# Treatment Program

Test Items	Tank 1	Tank 2	Tank 3
Organo-Phosphonate	5ppm	5ppm	5ppm
DTEA II Chemistry	3ppm	4.5ppm	7.5ppm
Carbon Steel	Yes	Yes	Yes
Admiralty Brass	Yes	Yes	Yes



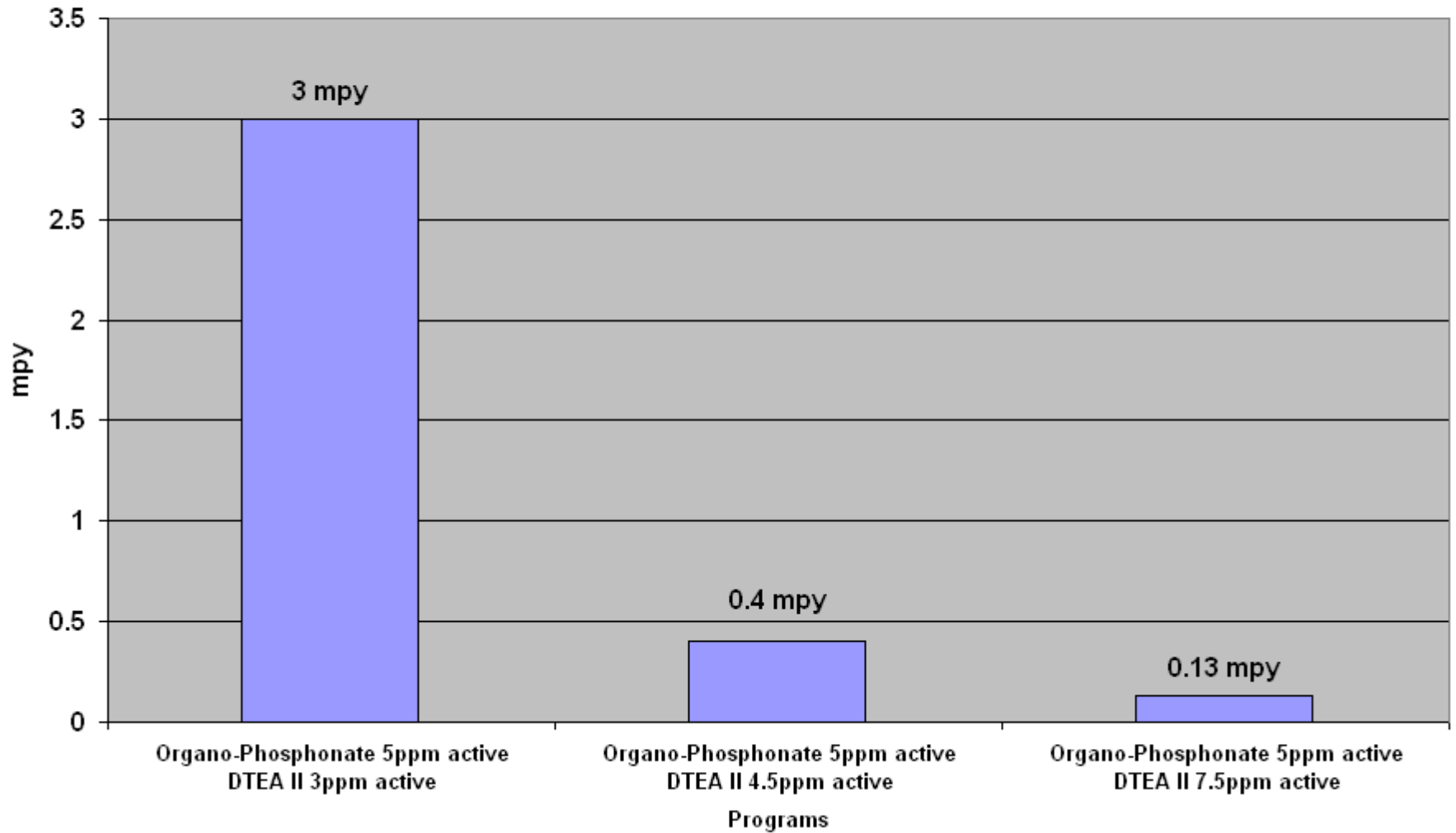
# Tank\* Test Conditions

- Duration
- Temperature
- Total Hardness
- pH
- Water Source
- Flow across electrodes
- 5 days
- 120 ( F)
- ~100ppm (as CaCO<sub>3</sub>)
- 8:00-9:00
- City drinking water
- 5gpm

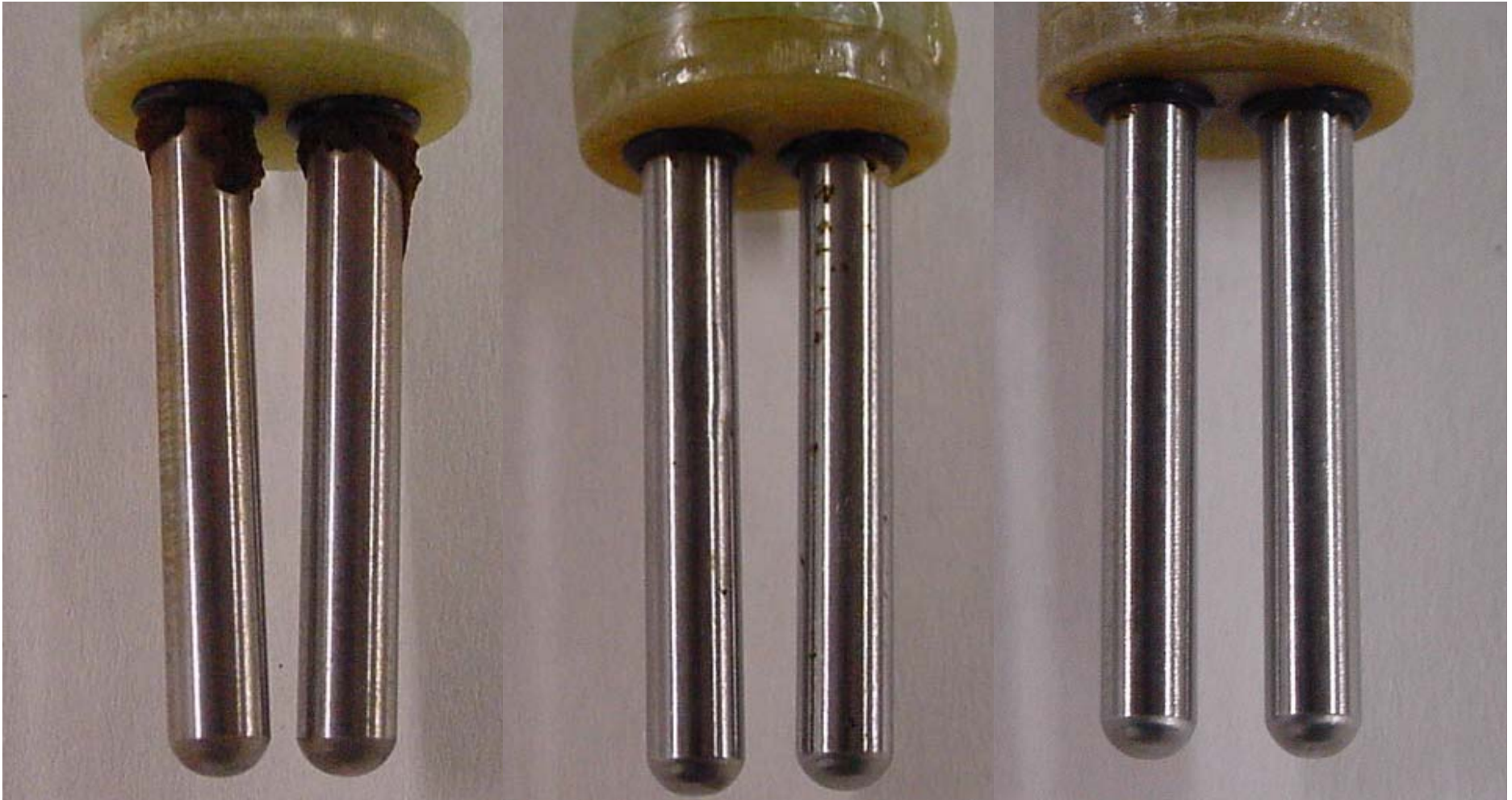
\* Tank Volume – 22 liters



## LABORATORY EVALUATION OF DTEA II CHEMISTRY Carbon Steel in Closed Loop System



## Corrator Carbon Steel Electrodes from Laboratory Evaluation

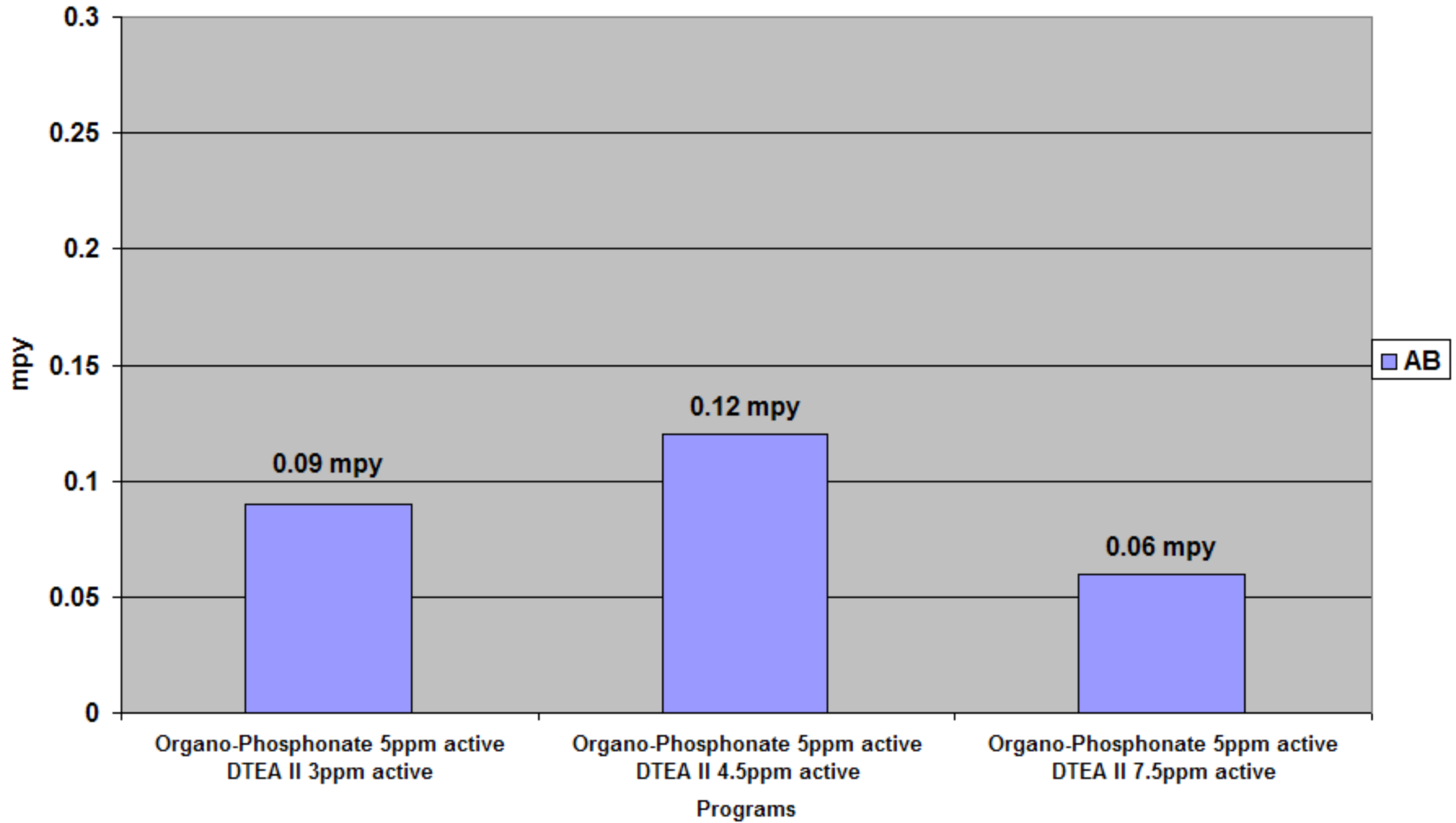


OP – 5 ppm  
DTEA II™ 3 ppm active

OP – 5 ppm  
DTEA II™ 4.5 ppm active

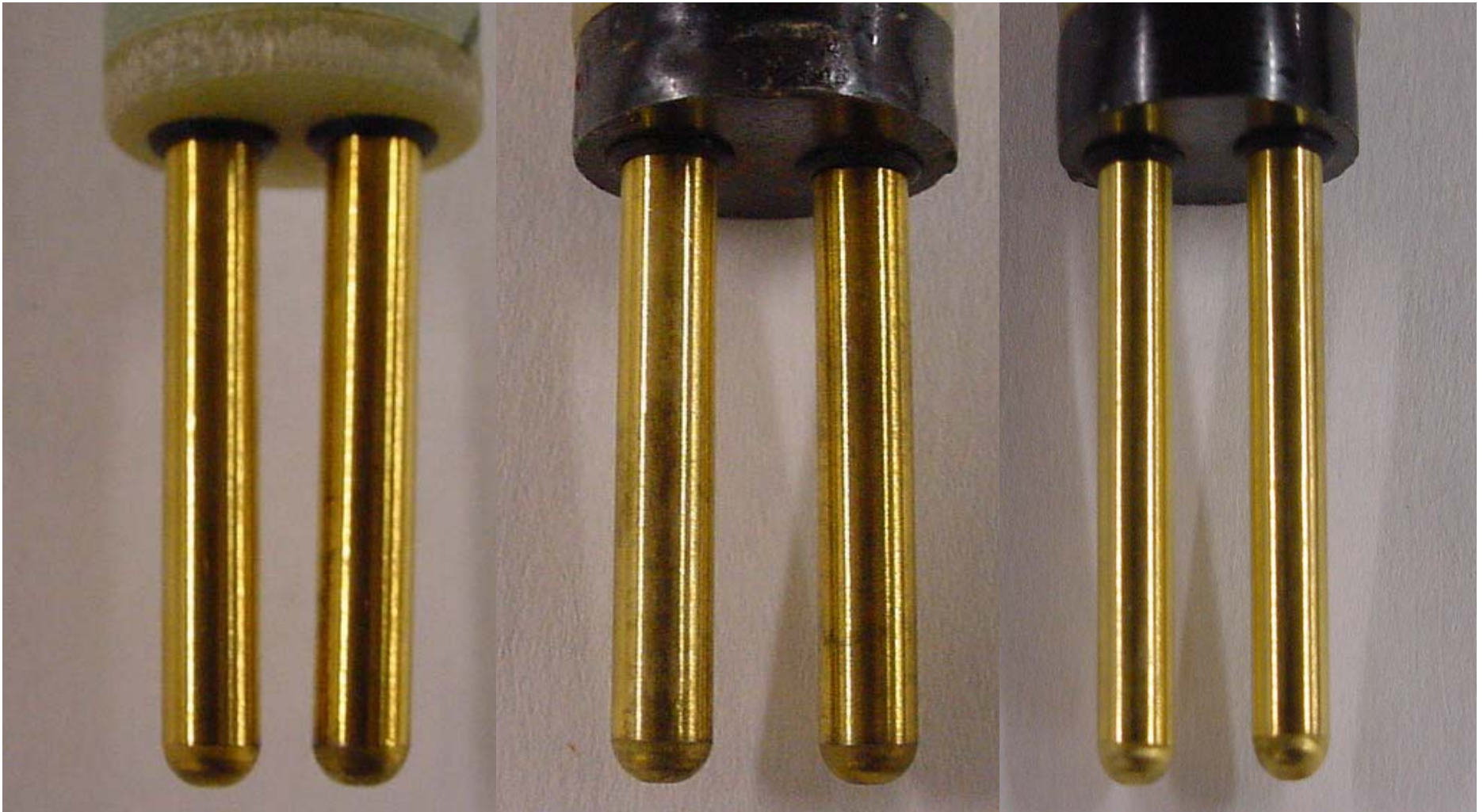
OP – 5 ppm  
DTEA II™ 7.5 ppm active

## LABORATORY EVALUATION OF DTEA II CHEMISTRY Admiralty Brass in Closed Loop System





## Corrator Admiralty Brass Electrodes from Laboratory Evaluation



OP – 5 ppm  
DTEA II™ 3 ppm active

OP – 5 ppm  
DTEA II™ 4.5 ppm active

OP – 5 ppm  
DTEA II™ 7.5 ppm active



# Laboratory Set-up for Corrosion Studies



# Conclusions from Closed Loop Evaluation

- Carbon steel corrosion performance
  - fair at 5/3ppm of Organo-Phosphonate/ DTEA II™ chemistry
  - excellent at 5/4.5ppm and 5/7.5ppm
- The appearance (photo) of the carbon steel electrodes
  - fair in the 5/3ppm
  - excellent at 5/4.5ppm and 5/7.5ppm
- Admiralty brass corrosion performance was excellent in all three test
- The appearance (photo) of the admiralty brass electrodes was excellent on all three runs
- Lab Study Demonstrated Benefit of DTEA II™ Chemistry when added to a Traditional Corrosion Inhibitor Program\*

\* Note this program has not been optimized



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