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Cleaner and Rust Preventative Experiment

To: Customer

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Project #: 15-077-1825.bis

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Background:

Customer has been experiencing corrosion events on their metal parts at various stages in their wash procedure and are interested in using a rust preventative chemical to eliminate this issue.

Sample Received:

Several bottles of sample chemicals were received. Each on was in excellent condition and individually packaged in separate bags and wrapped with padding.

1. Two bottles of Castrol Techniclean S 5001
2. One bottle of Castrol Synlube L4 RP additive
3. One bottle of Multan B-204 Semi-sythetic coolant
4. One bottle of Rustillo rust preventative

Method:

CC-018 was followed for this experiment. (modified ASTM D1748)

Materials:

1) 22 carbon steel Q-panels
2) BioCorr (B# 14094)

Procedure:

CC-018 was followed for this test. After cleaning off each panel with methanol they were treated with their respective chemicals and allowed to dry overnight. In the next morning the panels were placed in ASTM 1748 conditions and run until failure.

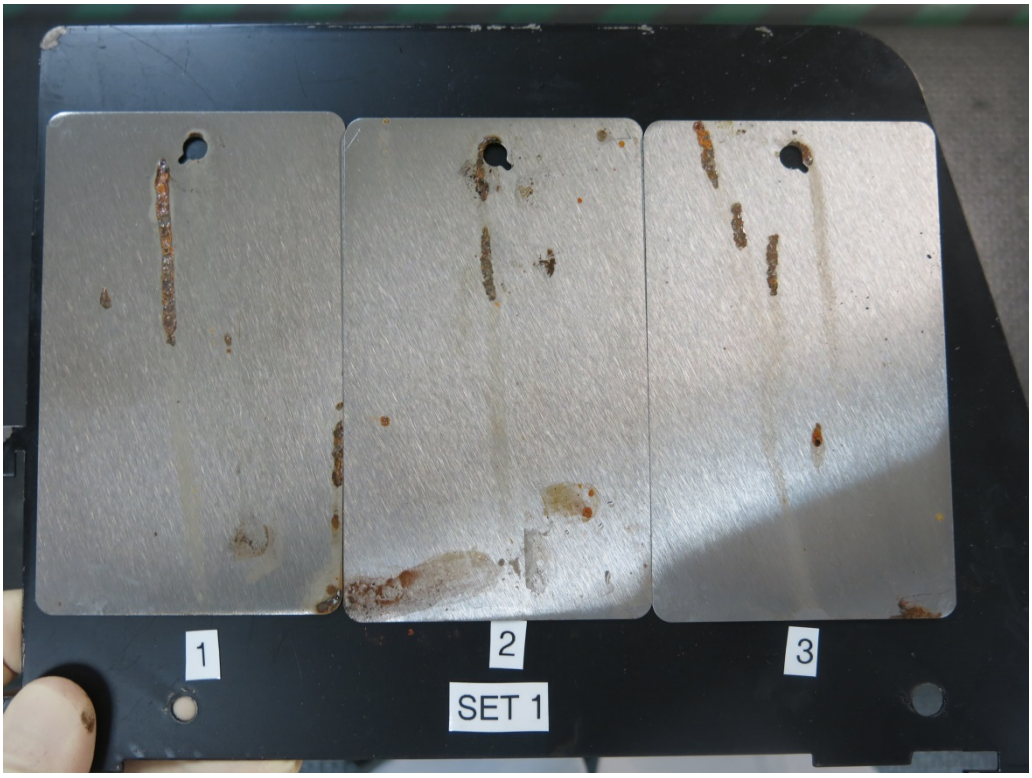
Results:

Sample	Description	Rust First Noticed	Run Time (Hours)
Control	Control	5/27/15 at 8:30a	24
1-1	Rustillo	6/3/15 at 12:30p	196
1-2			
1-3			
2-1	Techniclean	5/28/15 at 8:30a	48
2-2			
2-3			
3-1	Synlube	5/28/15 at 8:30a	48
3-2			
3-3			
4-1	50% Synlube + 50% Techniclean	6/11/15 at 2:00p	389
4-2		6/11/15 at 2:00p	389
4-3		6/8/15 at 10:00a	313
5-1	Coolant	6/11/15 at 2:00p	389
5-2		6/11/15 at 2:00p	389
5-3		6/12/15 at 10:00a	169
6-1	BioCorr	6/16/15 at 8:00a	503
6-2		6/16/15 at 8:00a	503
6-3		6/8/15 at 10:00a	313
7-1	25% Synlube + 25% Techniclean + 50% BioCorr	6/11/15 at 2:00p	389
7-2		6/8/15 at 10:00a	313
7-3		6/8/15 at 10:00a	313

Table 1: The corrosion dates for the various protection systems

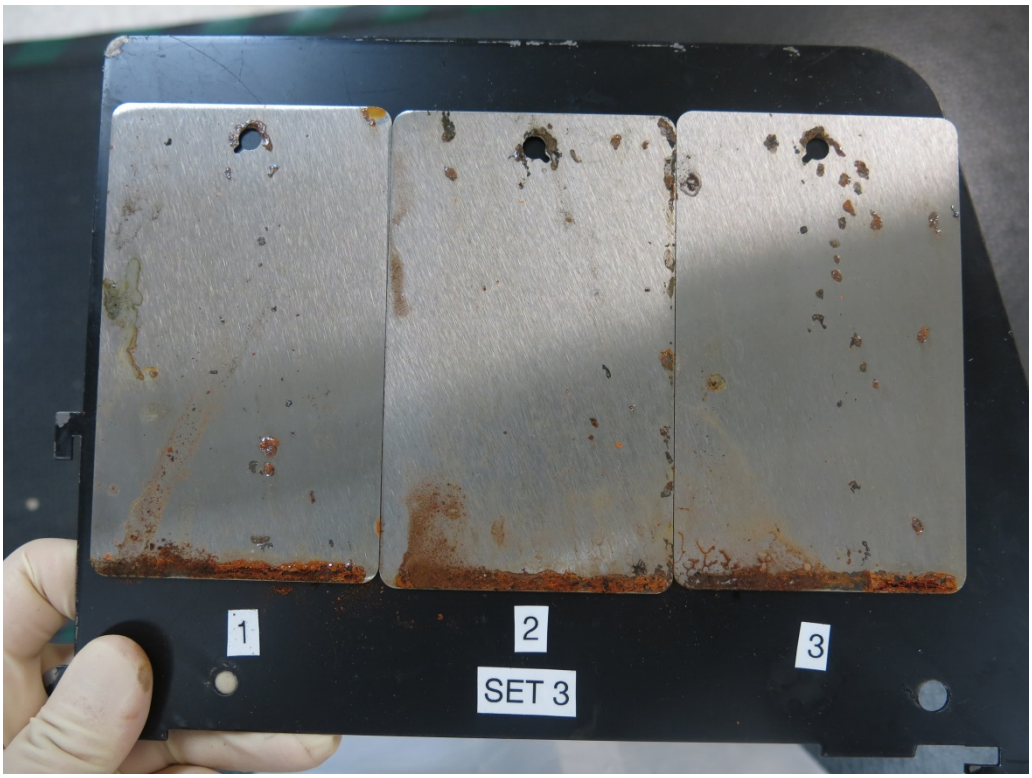
Photos:

Picture 1: The untreated control panel after 500 hours in the humidity cabinet



Picture 2: The Rustillo-treated panels after 500 hours in the humidity cabinet

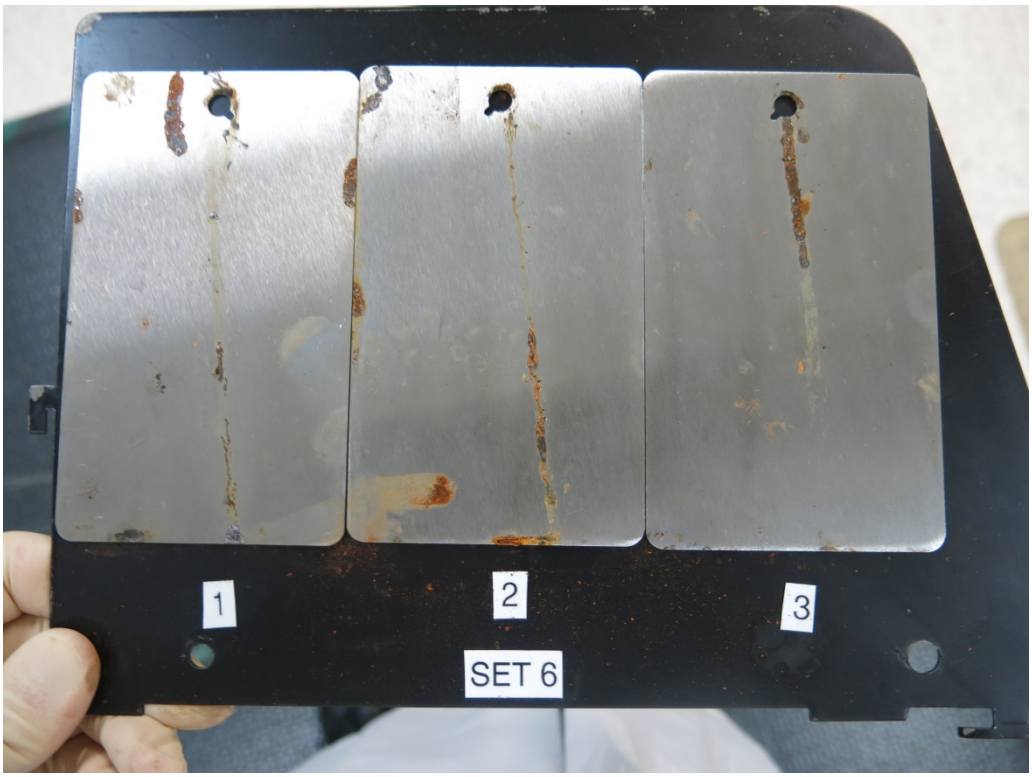
Picture 3: The Techniclean-treated panels after 500 hours in the humidity cabinet



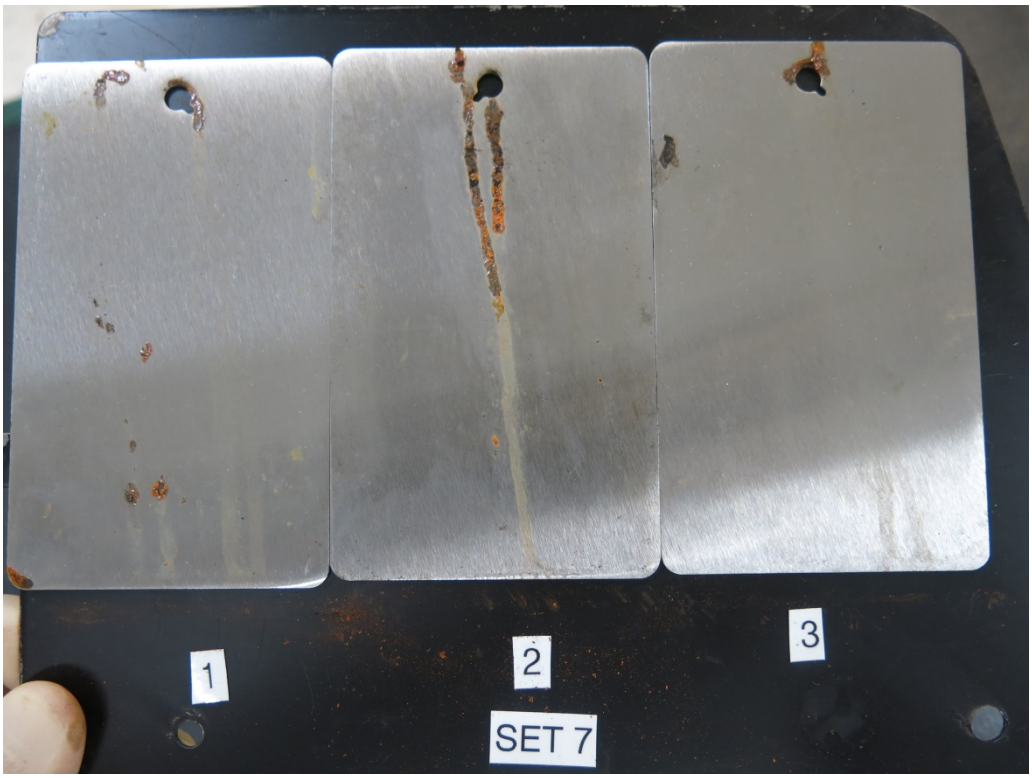
Picture 4: The Synlube-treated panels after 500 hours in the humidity cabinet

Picture 5: The Synlube and Techniclean-treated panels after 500 hours in the humidity cabinet

Picture 6: The coolant-treated panels after 500 hours in the humidity cabinet



Picture 7: The BioCorr-treated panel after 500 hours in the humidity cabinet



Picture 8: The Synlube, Techniclean, and BioCorr-treated panels after 500 hours in the humidity cabinet

Interpretations:

Both protection systems which incorporated BioCorr achieved very good results from the test. Both of these systems took a long time to corrode and had a very slow corrosion rate once corrosion began. The coolant and Synlube/Techniclean-treated panels also had very long protection durations, but once corrosion began, it went at a fast rate. It should also be noted that while the Rustillo part did show signs of corrosion relatively early in the test, its ultimate rate of corrosion was very low. Ultimately BioCorr provided both the longest duration of corrosion protection and the slowest rate.