

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2001
 DateRun: 09/17/2001
 Experimenters: Jason Marshall
 ClientType: Metal
 ProjectNumber: Project #1
 Substrates: Steel
 PartType: Coupon
 Contaminants: Coatings
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric

Purpose: Evaluating previously tested effective products on second Stubbs rust preventative

Experimental Procedure: Six successful cleaners were selected from the previous trial. Two additional cleaners were used based on client's current cleaning practices. Each product was diluted to 5% with DI water in a 600 ml beaker. Twenty-one preweighed steel coupons were coated with the Rustill DWX 30 using a hand held swab. The rust preventative was allowed to sit on the coupons for 10 minutes prior to being reweighed. Following the second weighing, three coupons were immersed into each solution and allowed to soak for 3 minutes at 130 F. At the end of the 3 minutes, each coupon was rinsed in a tap water bath at 120 F for 30 seconds and dried with a heat gun at 500 F for 1 minute. After the coupons cooled to room temperature, a final weight was recorded and cleaning efficiencies were calculated.

Rust Preventatives: Castrol Rustilo DWX 30 (64742-82-1; 61790-48-5; 112-34-5)

Results: The cleaning efficiencies ranged from a low of 89.87% (Cerat Clean) to a high of 99.80% (Inproclean 3800). Only one cleaner, Oakite's Inproclean 3800, performed better than Dasco Clean. Four products removed over 99% of the contaminant from the steel coupons. All cleaners were better than the Certa Clean. The following table lists the calculated efficiencies and the product ranking.

Table 1. Cleaning Efficiencies

| Cleaner | Coupon 1 | Coupon 2 | Coupon 3 | Average | Std Dev | Rank |
|-------------|----------|----------|----------|---------|---------|------|
| Inproclean | 100.00 | 99.57 | 99.83 | 99.80 | 0.21 | 1 |
| Multikleen | 98.37 | 99.94 | 100.16 | 99.49 | 0.97 | 4 |
| Beyond | 99.21 | 99.44 | 99.89 | 99.51 | 0.35 | 3 |
| Daso Clean | 100.00 | 99.59 | 99.45 | 99.68 | 0.29 | 2 |
| SC Aircraft | 95.82 | 96.86 | 97.80 | 96.82 | 0.99 | 5 |
| Sea Wash | 96.45 | 90.81 | 91.54 | 92.93 | 3.07 | 6 |
| Certa Clean | 89.87 | 90.34 | 89.40 | 89.87 | 0.47 | 7 |

Summary:

| Substrates: | | Steel | | | |
|-------------------------|---|----------|-------------|-------------------------------------|---------------|
| Contaminants: | | Coatings | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Oakite Products | Inproclean 3800 | 5 | 99.80 | <input checked="" type="checkbox"/> | |
| Gemtek Products | SC Aircraft & Metal Cleaner Super Concentrate | 5 | 96.82 | <input type="checkbox"/> | |
| Heatbath Corporation | Multi-Kleen 1568 | 5 | 99.49 | <input checked="" type="checkbox"/> | |
| Today & Beyond | Beyond 2001 | 5 | 99.51 | <input checked="" type="checkbox"/> | |
| Warren Chemical Company | Sea Wash 700 New | 5 | 92.93 | <input type="checkbox"/> | |
| Houghton International | Cerfa Kleen 5387 | | 89.87 | <input type="checkbox"/> | |
| DA Stuart Company | Dasco Kleen 3250 | | 99.68 | <input checked="" type="checkbox"/> | |

Conclusion: The four products that removed over 99% of the contaminant will be used in the next trial involving a third rust preventative solution.