

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2009

DateRun: 11/05/2009

Experimenters: Junhee Cho, Johnny Le

ClientType: Ceramic Coating Company

ProjectNumber: Project #2

Substrates: Aluminum

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric

Purpose: To evaluate top five products on fifth supplied contaminant using manual cleaning

Experimental Procedure: Five products from the previous trials were selected based on performance. All were used at room temperature. Two alkaline aqueous cleaners were diluted to 5% using DI water in 300 ml beakers. Three cleaners were used at full strength. Fifteen preweighed aluminum coupons were coated with Mobile DTE light oil using a handheld swab. The contaminated coupons were weighed again to determine the amount of soil added.

Each cleaner tested with three coupons. Three coupons were placed into a Gardner Straight Line Washability unit. A Kimberly Clark Reinforced paper towel was attached to the cleaning sled and soaked with 5-7 sprays of cleaning solutions. Each coupon was sprayed 3 times with the same cleaning solution. First, Coupon was cleaned for 15 cycles two times; after coupon was cleaned for 15 cycles, experimenter changed the paper towel and soaked with 5 spray of same cleaning solution. At the end of the cleaning, coupons were dried at room temperature naturally. Final weights were recorded and efficiencies were calculated and recorded.

Results: Two of the five worked very well on the light oil, removing more than 93%. Two other products removed just under 85%. The Activeion unit had the lowest efficiency at 74%. However, two of the three coupons had removal rates higher than 90% and one lower then 40%. A reevaluation of this product will be conducted to determine effectiveness. The table lists the amount of oil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|------------------------------|------------|----------|-----------|
| Shopmater RC 100% | | | |
| | 0.0490 | 0.0097 | 80.20 |
| | 0.0379 | 0.0065 | 82.85 |
| | 0.0312 | 0.0043 | 86.22 |
| SC Aircraft metal cleaner 5% | | | |
| | 0.0246 | 0.0008 | 96.75 |
| | 0.0271 | 0.0011 | 95.94 |
| | 0.0208 | 0.0004 | 98.08 |
| Solsafe 245 100% | | | |
| | 0.0199 | 0.0016 | 91.96 |
| | 0.0265 | 0.0058 | 78.11 |
| | 0.0332 | 0.0067 | 79.82 |
| Detergent 8 5% | | | |
| | 0.0276 | 0.0021 | 92.39 |
| | 0.0275 | 0.0021 | 92.36 |
| | 0.0285 | 0.0016 | 94.39 |
| Activeion | | | |
| | 0.0322 | 0.0031 | 90.37 |
| | 0.0232 | 0.0016 | 93.10 |
| | 0.0271 | 0.0164 | 39.48 |

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|----------|-----------------------------|
| Summary: | Substrates: Aluminum |
| | Contaminants: Oil |

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| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
|-------------------------------------|--|--------|-------------|-------------------------------------|---------------|
| Buckeye International | Shopmaster RC | 100 | 83.09 | <input type="checkbox"/> | |
| Gemtek Products | SC Aircraft & Metal Cleaner Super Concentrate | 5 | 96.92 | <input checked="" type="checkbox"/> | |
| Bio Chem Systems | Solsafe 245 | 100 | 83.30 | <input type="checkbox"/> | |
| Alconox Inc | Detergent 8 | 5 | 93.05 | <input checked="" type="checkbox"/> | |
| Activeion Cleaning Solutions LLC | Activeion Pro | 100 | 74.32 | <input type="checkbox"/> | |

Conclusion:

Based on past performance on the previous four contaminants, all five products will be tested on the fifth supplied contaminant under the same conditions.