

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2009

DateRun: 10/28/2009

Experimenters: Junhee Cho, Scott Nadolna, 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 third 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 25 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: All five products removed more than 90% of the oil from the aluminum coupons using simulated manual cleaning. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|------------------------------------|------------|----------|-----------|
| Buckeye_Shopmater RC 100% | | | |
| | 0.1004 | 0.0128 | 87.25 |
| | 0.2172 | 0.0142 | 93.46 |
| | 0.2324 | 0.0156 | 93.29 |
| Gemtek_SC Aircafe metal cleaner 5% | | | |
| | 0.2534 | 0.0128 | 94.95 |
| | 0.2249 | 0.0114 | 94.93 |
| | 0.2654 | 0.0067 | 97.48 |
| Biochem_Solsafe 245 100% | | | |
| | 0.2059 | 0.0139 | 93.25 |
| | 0.2127 | 0.0135 | 93.65 |
| | 0.2246 | 0.0093 | 95.86 |
| Alconox_Detergent 8 5% | | | |
| | 0.1148 | 0.0091 | 92.07 |
| | 0.2454 | 0.0083 | 96.62 |
| | 0.2292 | 0.0103 | 95.51 |
| Activion | | | |
| | 0.2715 | 0.0175 | 93.55 |
| | 0.2483 | 0.0103 | 95.85 |
| | 0.2557 | 0.0183 | 92.84 |

Summary:

| | | | | | |
|-----------------------|----------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Aluminum | | | | |
| Contaminants: | Oil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Buckeye International | Shopmaster RC | 100 | 91.33 | <input checked="" type="checkbox"/> | |

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|-------------------------------------|--|-----|-------|-------------------------------------|--|
| Gemtek Products | SC Aircraft & Metal Cleaner Super Concentrate | 5 | 95.79 | <input checked="" type="checkbox"/> | |
| Bio Chem Systems | Solsafe 245 | 100 | 94.25 | <input checked="" type="checkbox"/> | |
| Alconox Inc | Detergent 8 | 5 | 94.73 | <input checked="" type="checkbox"/> | |
| Activeion Cleaning Solutions LLC | Activeion Pro | 100 | 94.08 | <input checked="" type="checkbox"/> | |

Conclusion: The same five products will be tested on the fourth supplied soil under the same conditions.