

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2009
 DateRun: 11/03/2009
 Experimenters: 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 sixth 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 Poseo Premium HPL 6 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: Four of the five worked very well on the light oil, removing more than 85%. The Activeion unit had the lowest efficiency at 75%. 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% | | | |
| | 0.0418 | 0.0048 | 88.52 |
| | 0.0366 | 0.0050 | 86.34 |
| | 0.0424 | 0.0039 | 90.80 |
| SC Aircraft metal cleaner 5% | | | |
| | 0.0229 | 0.0020 | 91.27 |
| | 0.0122 | 0.0017 | 86.07 |
| | 0.0160 | 0.0035 | 78.13 |
| Solsafe 245 100% | | | |
| | 0.1359 | 0.0160 | 88.23 |
| | 0.0465 | 0.0088 | 81.08 |
| | 0.0324 | 0.0022 | 93.21 |
| Detergent 8 5% | | | |
| | 0.0683 | 0.0045 | 93.41 |
| | 0.0202 | 0.0025 | 87.62 |
| | 0.0257 | 0.0037 | 85.60 |
| Activeion | | | |
| | 0.0247 | 0.0020 | 91.90 |
| | 0.0271 | 0.0099 | 63.47 |
| | 0.0201 | 0.0054 | 73.13 |

Summary:

| | | | | | |
|-----------------------|----------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Aluminum | | | | |
| Contaminants: | Oil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Buckeye International | Shopmaster RC | 100 | 88.55 | <input checked="" type="checkbox"/> | |

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|----------------------------------|---|-----|-------|-------------------------------------|--|
| Gemtek Products | SC Aircraft & Metal Cleaner Super Concentrate | 5 | 85.15 | <input checked="" type="checkbox"/> | |
| Bio Chem Systems | Solsafe 245 | 100 | 87.50 | <input checked="" type="checkbox"/> | |
| Alconox Inc | Detergent 8 | 5 | 88.88 | <input checked="" type="checkbox"/> | |
| Activeion Cleaning Solutions LLC | Activeion Pro | 100 | 76.17 | <input type="checkbox"/> | |

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