

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2009
 DateRun: 11/04/2009
 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 seventh 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 Texaca Rando HD22-88 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 worked well on the oil, removing more than 85%. 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% | | | |
| | 0.0509 | 0.0095 | 81.34 |
| | 0.0307 | 0.0021 | 93.16 |
| | 0.0373 | 0.0024 | 93.57 |
| SC Aircraft metal cleaner 5% | | | |
| | 0.0255 | 0.0092 | 63.92 |
| | 0.0276 | 0.0013 | 95.29 |
| | 0.0126 | 0.0008 | 93.65 |
| Solsafe 245 100% | | | |
| | 0.1292 | 0.0047 | 96.36 |
| | 0.0506 | 0.0065 | 87.15 |
| | 0.0438 | 0.0021 | 95.21 |
| Detergent 8 5% | | | |
| | 0.0403 | 0.0050 | 87.59 |
| | 0.0539 | 0.0027 | 94.99 |
| | 0.0217 | 0.0021 | 90.32 |
| Activeion | | | |
| | 0.0537 | 0.0060 | 88.83 |
| | 0.0559 | 0.0039 | 93.02 |
| | 0.0322 | 0.0064 | 80.12 |

Summary:

| | | | | | |
|-----------------------|----------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Aluminum | | | | |
| Contaminants: | Oil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Buckeye International | Shopmaster RC | 100 | 89.35 | <input checked="" type="checkbox"/> | |

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|----------------------------------|---|-----|-------|-------------------------------------|--|
| Gemtek Products | SC Aircraft & Metal Cleaner Super Concentrate | 5 | 84.29 | <input checked="" type="checkbox"/> | |
| Bio Chem Systems | Solsafe 245 | 100 | 92.91 | <input checked="" type="checkbox"/> | |
| Alconox Inc | Detergent 8 | 5 | 90.97 | <input checked="" type="checkbox"/> | |
| Activeion Cleaning Solutions LLC | Activeion Pro | 100 | 87.32 | <input checked="" 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.