

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2009  
 DateRun: 11/03/2009  
 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:

|                       |                      |               |                    |                                     |                      |
|-----------------------|----------------------|---------------|--------------------|-------------------------------------|----------------------|
| <b>Substrates:</b>    | Aluminum             |               |                    |                                     |                      |
| <b>Contaminants:</b>  | Oil                  |               |                    |                                     |                      |
| <b>Company Name:</b>  | <b>Product Name:</b> | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>                   | <b>Observations:</b> |
| Buckeye International | Shopmaster RC        | 100           | 89.35              | <input checked="" type="checkbox"/> |                      |
| Gemtek Products       |                      | 5             | 84.29              |                                     |                      |

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|                                     |  |     |       |                                     |  |
|-------------------------------------|--|-----|-------|-------------------------------------|--|
|                                     | SC Aircraft & Metal Cleaner<br>Super Concentrate |     |       | <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<br>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.