

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2018

DateRun: 05/02/2018

Experimenters: Vinh Tran, Spencer Gifford

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Aluminum, Ceramics, Plastic

PartType: Coupon

Contaminants: Greases, Dirt, Oil

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric

Purpose: To evaluate the supplied product for car wheel dirt removal from aluminum, ceramic, and plastic surfaces following GS 35 methodology.

Experimental Procedure: Supplied products were diluted to a concentration of 4oz of cleaners to 1 gallon of tap water at room temperature. Pre-weighed aluminum and plastic coupons were soiled with 0.5 grams of vehicle dirt contaminant (Bike Dirt Soil: 16% w/w, Super White Multi-Purpose Lithium Grease: 45% w/w, and Used Motor Oil 39% w/w) using a hand held swab. Once dirtied, the aluminum ceramic and plastic coupons were re-weighed again to obtain initial weights of the contaminants. Three of the same type of coupons were placed into a Gardner Straight Line Washability unit. A Wypall X60 reinforced wipe was attached to the cleaning sled and soaked with 1 spray cleaning solutions. Each coupon was sprayed once with the same cleaning solution. The solution was allowed to penetrate for 30 seconds followed by cleaning in the SLW unit for 20 cycles (~33 seconds). The cleaned coupons dried for one hour before taking the final weights.

Results:

| Cleaner | Substrate | Initial wt. of Cont. (g) | Final wt. of Cont. (g) | Cont. Removed (%) | Avg. Cont. Removed (%) | Overall Avg. Cont. Removed (%) |
|------------------------------|-----------|--------------------------|------------------------|-------------------|------------------------|--------------------------------|
| Alpha Chemical Wheel Guard 1 | Aluminum | 20.8001 | 21.291 | 93.46 | 91.97 | 91.91 |
| | | 20.7845 | 21.2712 | 90.88 | | |
| | | 22.1642 | 22.6767 | 91.57 | | |
| | Ceramic | 52.1519 | 52.63 | 95.08 | 93.59 | |
| | | 52.3698 | 52.8572 | 97.11 | | |
| | | 50.9381 | 51.4199 | 88.56 | | |
| | Plastic | 32.4343 | 32.909 | 100.11 | 90.16 | |
| | | 33.9744 | 34.453 | 84.75 | | |
| | | 34.0865 | 34.6545 | 85.63 | | |
| Alpha Chemical Wheel Guard 2 | Aluminum | 21.9978 | 22.4872 | 89.11 | 88.83 | 86.40 |
| | | 22.167 | 22.6957 | 88.56 | | |
| | | 22.0611 | 22.5401 | 88.81 | | |
| | Ceramic | 51.7117 | 52.2094 | 82.86 | 78.37 | |
| | | 52.6866 | 53.1845 | 77.57 | | |
| | | 54.217 | 54.6937 | 74.68 | | |
| | Plastic | 34.3233 | 34.867 | 91.21 | 92.00 | |
| | | 34.119 | 34.6208 | 90.16 | | |
| | | 32.2588 | 32.7758 | 94.64 | | |
| Alpha Chemical Wheel Guard 3 | Aluminum | 22.1491 | 22.6819 | 95.76 | 95.42 | 92.82 |
| | | 22.1552 | 22.6811 | 94.56 | | |
| | | 21.9527 | 22.4804 | 95.94 | | |
| | Ceramic | 51.9448 | 52.4516 | 85.73 | 89.52 | |
| | | 52.1225 | 52.6188 | 91.72 | | |
| | | 52.156 | 52.6345 | 91.12 | | |
| | Plastic | 34.1453 | 34.6946 | 91.23 | 93.52 | |
| | | 34.1558 | 34.694 | 93.20 | | |
| | | 34.1594 | 34.6178 | 96.14 | | |

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For the most part, there was very little difference in effectiveness between Chemical Wheel Guards 1 and 3, however Wheel Guard 2 left noticeably more residue visually and was roughly 6% less effective than the other two formulations. Despite this, it was still effective at removing the contaminant in every case but on Ceramics. In order of effectiveness, Wheel Guard 1 was the most consistent, with Wheel Guard 3 coming right behind it.

Summary:

| | | | | | |
|-------------------------|------------------------------|-----------------------------|--------------------|-------------------------------------|----------------------|
| Substrates: | | Aluminum, Ceramics, Plastic | | | |
| Contaminants: | | Greases, Dirt, Oil | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Alpha Chemical Services | Alpha Chemical Wheel Guard 1 | 4oz/ 1gallon | 91.91 | <input checked="" type="checkbox"/> | |
| Alpha Chemical Services | Alpha Chemical Wheel Guard 2 | 4oz/ 1gallon | 86.40 | <input type="checkbox"/> | |
| Alpha Chemical Services | Alpha Chemical Wheel Guard 3 | 4oz/ 1gallon | 92.82 | <input type="checkbox"/> | |

Conclusion:

All three cleaners were effective in removing the contaminants from the coupons.