

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2020  
DateRun: 10/07/2020  
Experimenters: Nicole Kebler  
ClientType: Bolt, Screw & Nut Manufacturer  
ProjectNumber: Project #1  
Substrates: Aluminum  
PartType: Coupon  
Contaminants: Greases  
Cleaning Methods: Immersion/Soak  
Analytical Methods: Gravimetric  
Purpose: To evaluate the removal of grease on aluminum coupons using unheated immersion for 15 minutes.  
\*test\*

Experimental Procedure: Four of eight cleaning products were diluted with tap water at room temperature to vendor recommended concentration. Three cleaning products were used at the recommended 100% dilution and the solvent option was also used at 100% for industrial testing; all cleaners and solutions were measured for 200 mL. Pre-weighed aluminum coupons were coated over 1/3 of the coupon with grease that has been provided by the company by using a metal spatula; three coupons were used for each cleaner/solvent. They were allowed a 24-hour dry time at room temperature; their dirty weights were recorded. The coupons were immersed in the cleaners/solvents at room temperature for 15 minutes then were taken out and placed on trays with paper towels; they were left to dry for 24 hours. Final weights and observations were recorded and evaluated.

Cleaners/Solvents used:

1. Liquinox (1%)
2. Dimethyl Glutarate (100%)
3. Mirachem (20%)
4. Metalnox (100%)
5. Micro 90 (1%)
6. Smart Solve (100%)
7. SC-Aircraft (5%)
8. Ozzy Juice 3 (100%)

Results: Visual observation showed no removal from coupon. No grease left in cleaner/solution.

| Solvent/<br>Cleaner           | initial<br>weight<br>of soil | final<br>weight<br>of soil | %<br>Removal | Average |
|-------------------------------|------------------------------|----------------------------|--------------|---------|
| Liquinox<br>1%                | 0.5412                       | 0.5335                     | 1.42         | 0.55    |
|                               | -0.3534                      | -0.3551                    | -0.48        |         |
|                               | 0.6815                       | 0.6767                     | 0.70         |         |
| Dimethyl<br>Glutarate<br>100% | 0.4954                       | 0.4875                     | 1.59         | -0.49   |
|                               | 0.8039                       | 0.8302                     | -3.27        |         |
|                               | 0.6168                       | 0.6155                     | 0.21         |         |
| Mirachem<br>20%               | 0.8626                       | 0.8649                     | -0.27        | 0.04    |
|                               | 0.9650                       | 0.9688                     | -0.39        |         |
|                               | 0.6192                       | 0.6143                     | 0.79         |         |
| Metalnox<br>100%              | 0.4965                       | 0.3470                     | 30.11        | 24.93   |
|                               | 1.0968                       | 0.8956                     | 18.34        |         |
|                               | 0.6738                       | 0.4964                     | 26.33        |         |
| Micro 90<br>1%                | 0.6921                       | 0.6751                     | 2.46         | 1.77    |
|                               | 0.7768                       | 0.7633                     | 1.74         |         |
|                               | 0.6226                       | 0.6157                     | 1.11         |         |
| Smart<br>Solve<br>100%        | 0.8242                       | 1.1521                     | -39.78       | -42.68  |
|                               | 0.5397                       | 0.8092                     | -49.94       |         |
|                               | 0.7665                       | 1.0603                     | -38.33       |         |
| SC-Aircraft<br>5%             | 0.5960                       | 0.5900                     | 1.01         | 0.81    |
|                               | 0.7601                       | 0.7534                     | 0.88         |         |
|                               | 0.7053                       | 0.7014                     | 0.55         |         |

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|                      |        |        |       |      |
|----------------------|--------|--------|-------|------|
| Ozzy Juice<br>3 100% | 0.7037 | 0.7073 | -0.51 | 0.48 |
|                      | 0.8546 | 0.8420 | 1.47  |      |
|                      | 0.9896 | 0.9848 | 0.49  |      |

Summary:

|                                    |   |               |                    |                          |                      |  |
|------------------------------------|---|---------------|--------------------|--------------------------|----------------------|--|
| <b>Substrates:</b>                 |   | Aluminum      |                    |                          |                      |  |
| <b>Contaminants:</b>               |   | Greases       |                    |                          |                      |  |
| <b>Company Name:</b>               | <b>Product Name:</b>                          | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>        | <b>Observations:</b> |  |
| Alconox Inc                        | Liquinox                                      | 1             | 0.55               | <input type="checkbox"/> |                      |  |
| Fisher Scientific                  | Dimethyl glutarate (CAS: 1119-40-0)           | 100           | -0.49              | <input type="checkbox"/> |                      |  |
| Mirachem Corporation               | Mirachem 500                                  | 20            | 0.04               | <input type="checkbox"/> |                      |  |
| Kyzen Corporation                  | Metalnox M6960                                | 100           | 24.93              | <input type="checkbox"/> |                      |  |
| International Products Corporation | Micro 90 Conc.                                | 1             | 1.77               | <input type="checkbox"/> |                      |  |
| United Laboratories International  | Smart Solve 605                               | 100           | -42.68             | <input type="checkbox"/> |                      |  |
| Gemtek Products                    | SC Aircraft & Metal Cleaner Super Concentrate | 5             | 0.81               | <input type="checkbox"/> |                      |  |
| Chem Free Corporation              | SW-3 Ozzy Juice (Improved Low Odor)           | 100           | 0.48               | <input type="checkbox"/> |                      |  |

Conclusion:

No cleaners showed removal of grease from aluminum substrate, the next steps are to add additional time and check effectiveness. Rinse step should be evaluated for cleaners that were wet after 24-hour dry time.