

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004
 DateRun: 11/08/2004
 Experimenters: Jason Marshall
 ClientType: Manufacturers of Precision Parts and Assemblies
 ProjectNumber: Project #1
 Substrates: Aluminum
 PartType: Coupon
 Contaminants: Lubricating/Lapping Oils
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric

Purpose: To evaluate aqueous cleaners for potential replacement of contact cleaner.

Experimental Procedure: Five products were selected from the lab's database of test results based on the products' past success in removing similar lubricants. Four of the products were diluted to 2% along with the client's current product using DI water in 600 ml beakers. A sixth product was used at full strength as recommended by the manufacturer. All six products were heated to 115 on a hot plate.

Eighteen preweighed 6061 aluminum coupons were coated with Fuch's Lubricants Renocut 6515 NC (mineral oil, vegetable oil) using a hand held swab. Coupons were allowed to sit for over an hour. A second set of weights were recorded to determine the amount of soil added. Three coupons were immersed into each cleaning product and cleaned using minimal agitation provided by a stir bar. Coupons were cleaned for 5 minutes, followed by a 15 second water rinse at 120 F and airblow off for 30 seconds at room temperature. Once dry, final weights were recorded and efficiencies were calculated for each product.

Results: All of the products out performed one of the client's current aqueous cleaners. Three of the products removed over 87% of the lubricant. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|---------------------|------------|----------|-----------|
| Amberclean Q3 | 0.0918 | 0.0481 | 47.60 |
| | 0.1934 | 0.0638 | 67.01 |
| | 0.1074 | 0.0203 | 81.10 |
| Formula 815 GD | 0.2651 | 0.0983 | 62.92 |
| | 0.1748 | 0.0528 | 69.79 |
| | 0.2564 | 0.0552 | 78.47 |
| Inproclean 3800 | 0.1845 | 0.0421 | 77.18 |
| | 0.2610 | 0.0275 | 89.46 |
| | 0.2194 | 0.0459 | 79.08 |
| Surface Cleanse 930 | 0.2272 | 0.0076 | 96.65 |
| | 0.2441 | 0.0255 | 89.55 |
| | 0.2865 | 0.0085 | 97.03 |
| Valtron SP 2275 | 0.2827 | 0.0518 | 81.68 |
| | 0.2171 | 0.0205 | 90.56 |
| | 0.5620 | 0.0471 | 91.62 |
| Ionox HC2 | 0.3371 | 0.0702 | 79.18 |
| | 0.3519 | 0.0108 | 96.93 |
| | 0.3171 | 0.0095 | 97.00 |

Summary:

| | | | | | |
|-------------------------|--------------------------|---------------|--------------------|--------------------------|----------------------|
| Substrates: | Aluminum | | | | |
| Contaminants: | Lubricating/Lapping Oils | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Innovative Organics Inc | Amberclean Q3 | 2 | 65.24 | <input type="checkbox"/> | |
| Brulin Corporation | Formula 815 GD | 2 | 70.39 | <input type="checkbox"/> | |
| Oakite Products | Inproclean 3800 | 2 | 81.91 | <input type="checkbox"/> | |

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|------------------------------------|--|-----|-------|-------------------------------------|--|
| International Products Corporation | Surface Cleanse Concentrated Neutral 930 | 2 | 94.41 | <input checked="" type="checkbox"/> | |
| Valtech Corporation | Valtron SP 2275 | 2 | 87.95 | <input checked="" type="checkbox"/> | |
| Kyzen Corporation | Ionox HC 2 | 100 | 91.04 | <input checked="" type="checkbox"/> | |

Conclusion:

The same six products will be retested under similar conditions. Ultrasonic energy will be added to improve efficiency.