

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004
 DateRun: 05/07/2004
 Experimenters: Jason Marshall
 ClientType: Bicycle Manufacturer
 ProjectNumber: Project #1
 Substrates: Titanium
 PartType: Coupon
 Contaminants: Oil
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric

Purpose: To evaluate successful products on the third supplied contaminant

Experimental Procedure: Six cleaners were selected from the previous trial. All were aqueous based and were diluted to 5% using DI water in 600 ml beakers. All six products were heated to 120 F on a hot plate.

Eighteen preweighed titanium coupons were coated with client supplied oil, Exxon Mobil DTE Light, using a hand held swab and then weighed a second time to determine the amount of soil added. Three coupons were cleaned in each solution for 5 minutes using stir-bar agitation. Coupons were rinsed in tap water for 15 seconds at 120 F, followed by air blow off at room temperature. Once dry, coupons were weighed a final time and efficiencies for each cleaner were calculated.

Results: All six products removed over 97% of the oil in five minutes. Four of the six removed over 99%. The table lists the amount of oil added, the amount remaining and the efficiency for each coupon.

| Cleaner | Initial wt | Final wt | % Removed |
|-----------------------------|------------|----------|-----------|
| Aquavantage 1400 GD | 0.2562 | 0.0030 | 98.83 |
| | 0.0385 | 0.0013 | 96.62 |
| | 0.1300 | 0.0045 | 96.54 |
| SC Aircraft & Metal Cleaner | 0.1341 | 0.0005 | 99.63 |
| | 0.1189 | 0.0006 | 99.50 |
| | 0.0959 | 0.0010 | 98.96 |
| Micro 90 | 0.1076 | 0.0000 | 100.00 |
| | 0.0963 | 0.0002 | 99.79 |
| | 0.1903 | -0.0001 | 100.05 |
| Daraclean 282 GF | 0.1014 | 0.0004 | 99.61 |
| | 0.1934 | -0.0003 | 100.16 |
| | 0.1102 | -0.0001 | 100.09 |
| Inproclean 3800 | 0.1903 | -0.0004 | 100.21 |
| | 0.1736 | 0.0003 | 99.83 |
| | 0.2083 | 0.0001 | 99.95 |
| Beyond 2004 | 0.1099 | 0.0007 | 99.36 |
| | 0.1298 | 0.0006 | 99.54 |
| | 0.0916 | 0.0026 | 97.16 |

Summary:

| Substrates: | Titanium | | | | |
|------------------------------------|---|--------|-------------|-------------------------------------|---------------|
| Contaminants: | Oil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Brulin Corporation | Aquavantage 1400 | 5 | 97.33 | <input checked="" type="checkbox"/> | |
| Gemtek Products | SC Aircraft & Metal Cleaner Super Concentrate | 5 | 99.36 | <input checked="" type="checkbox"/> | |
| International Products Corporation | Micro 90 Conc. | 5 | 99.95 | <input checked="" type="checkbox"/> | |
| Magnaflux | Daraclean 282 GF | 5 | 99.95 | <input checked="" type="checkbox"/> | |
| Oakite Products | Inproclean 3800 | 5 | 100.00 | <input checked="" type="checkbox"/> | |

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| Today & Beyond | Beyond 2004 | 5 | 98.69 | <input checked="" type="checkbox"/> | |
|----------------|-------------|---|-------|-------------------------------------|--|

Conclusion:

The five products that removed over 98% of the oil will be used on the fourth supplied soil under the same conditions.