

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004  
 DateRun: 05/12/2004  
 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 five products on the fourth supplied soil

Experimental Procedure: Five 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.  
 Fifteen preweighed titanium coupons were coated with client supplied peanut oil, 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 five products removed over 98% of the oil in five minutes. Three of the five 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 |
|-----------------------------|------------|----------|-----------|
| SC Aircraft & Metal Cleaner | 0.1518     | 0.0024   | 98.42     |
|                             | 0.1971     | 0.0012   | 99.39     |
|                             | 0.0836     | 0.0024   | 97.13     |
| Micro 90                    | 0.1452     | 0.0003   | 99.79     |
|                             | 0.0777     | -0.0003  | 100.39    |
|                             | 0.1994     | 0.0005   | 99.75     |
| Daraclean 282 GF            | 0.0870     | 0.0006   | 99.31     |
|                             | 0.1537     | 0.0005   | 99.67     |
|                             | 0.0984     | 0.0003   | 99.70     |
| Inproclean 3800             | 0.1430     | -0.0001  | 100.07    |
|                             | 0.1101     | 0.0002   | 99.82     |
|                             | 0.1125     | 0.0004   | 99.64     |
| Beyond 2004                 | 0.1036     | 0.0004   | 99.61     |
|                             | 0.1144     | 0.0019   | 98.34     |
|                             | 0.2136     | 0.0038   | 98.22     |

Summary:

|                                    |   |               |                    |                                     |                      |
|------------------------------------|---|---------------|--------------------|-------------------------------------|----------------------|
| <b>Substrates:</b>                 | Titanium                                      |               |                    |                                     |                      |
| <b>Contaminants:</b>               | Oil   |               |                    |                                     |                      |
| <b>Company Name:</b>               | <b>Product Name:</b>                          | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>                   | <b>Observations:</b> |
| Gemtek Products                    | SC Aircraft & Metal Cleaner Super Concentrate | 5             | 98.31              | <input checked="" type="checkbox"/> |                      |
| International Products Corporation | Micro 90 Conc.                                | 5             | 99.98              | <input checked="" type="checkbox"/> |                      |
| Magnaflux                          | Daraclean 282 GF                              | 5             | 99.56              | <input checked="" type="checkbox"/> |                      |
| Oakite Products                    | Inproclean 3800                               | 5             | 99.84              | <input checked="" type="checkbox"/> |                      |
| Today & Beyond                     | Beyond 2004                                   | 5             | 98.72              | <input checked="" type="checkbox"/> |                      |

Conclusion: The five products will all be tested on the flux. In addition, a few other products will be added for evaluation.