

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004  
 DateRun: 05/16/2004  
 Experimenters: Jason Marshall  
 ClientType: Bicycle Manufacturer  
 ProjectNumber: Project #1  
 Substrates: Titanium  
 PartType: Coupon  
 Contaminants: Inks  
 Cleaning Methods: Manual Wipe  
 Analytical Methods: Gravimetric

Purpose: To evaluate successful products on the final supplied contaminant.

Experimental Procedure: Five cleaners were selected from the previous trial. The five cleaners from the previous trials were diluted to 5% using DI water in 600 ml beakers at room temperature.

Fifteen preweighed titanium coupons were coated with ink from a Sharpie marker. The ink was applied first in a side to side manner and then in an up and down direction. Coupons were then weighed a second time to determine the amount of soil added. Three coupons were cleaned for about 2 minutes using a Gardner Straight Line Washability unit. Three coupons were placed into a Gardner Straight Line Washability unit. A Professional Painter's Rag was immersed into a beaker of the cleaning solutions and then attached to the cleaning sled. The cleaning unit was run for 75 cycles (~2 minutes). At the end of the cleaning cycle, coupons were weighed again and efficiencies were calculated.

Results: Two of the products, SC Aircraft and Micro 90, removed over 80% of the ink during manual cleaning. The other three products removed under 75%. 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 | 0.0021     | 0.0000   | 100.00    |
|                             | 0.0042     | 0.0001   | 97.62     |
|                             | 0.0028     | 0.0001   | 96.43     |
| Micro 90                    | 0.0021     | 0.0004   | 80.95     |
|                             | 0.0023     | 0.0002   | 91.30     |
|                             | 0.0018     | 0.0004   | 77.78     |
| Daraclean 282 GF            | 0.0016     | 0.0002   | 87.50     |
|                             | 0.0022     | 0.0005   | 77.27     |
|                             | 0.0017     | 0.0007   | 58.82     |
| Inproclean 3800             | 0.0031     | 0.0009   | 70.97     |
|                             | 0.0021     | 0.0011   | 47.62     |
|                             | 0.0024     | 0.0008   | 66.67     |
| Beyond 2004                 | 0.0020     | 0.0011   | 45.00     |
|                             | 0.0018     | 0.0004   | 77.78     |
|                             | 0.0012     | 0.0004   | 66.67     |

Summary:

|                                    |                                               |               |                    |                                     |                      |
|------------------------------------|-----------------------------------------------|---------------|--------------------|-------------------------------------|----------------------|
| <b>Substrates:</b>                 | Titanium                                      |               |                    |                                     |                      |
| <b>Contaminants:</b>               | Inks                                          |               |                    |                                     |                      |
| <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             | 98.02              | <input checked="" type="checkbox"/> |                      |
| International Products Corporation | Micro 90 Conc.                                | 5             | 83.34              | <input checked="" type="checkbox"/> |                      |
| Magnaflux                          | Daraclean 282 GF                              | 100           | 74.53              | <input type="checkbox"/>            |                      |
| Oakite Products                    | Inproclean 3800                               | 5             | 61.75              | <input type="checkbox"/>            |                      |
| Today & Beyond                     | Beyond 2004                                   | 5             | 63.15              | <input type="checkbox"/>            |                      |

Conclusion: The successful products will be used to clean some of the supplied parts.