# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004

DateRun: 07/07/2004

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 client requested products on the sixth supplied soil.

Experimental Procedure: The three cleaners were diluted to 5% using DI water in 600 ml beakers at room temperature.

Nine 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: One of the three products removed over 85%. The table below lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|---|---|---|---|
| M Aero | 0.0019 | 0.0002 | 89.47 |
| | 0.0030 | 0.0004 | 86.67 |
| | 0.0014 | 0.0002 | 85.71 |
| M Aero NS | 0.0014 | 0.0003 | 78.57 |
| | 0.0024 | 0.0008 | 66.67 |
| | 0.0025 | 0.0006 | 76.00 |
| M 400 | 0.0010 | 0.0007 | 30.00 |
| | 0.0011 | 0.0008 | 27.27 |
| | 0.0014 | 0.0010 | 28.57 |

Summary:

| **Substrates:** | Titanium |
|---|---|
| **Contaminants:** | Inks |

| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
|---|---|---|---|---|---|
| Church & Dwight Co Inc. | Armakleen M Aero | 5 | 87.28 | ☑ | |
| Church & Dwight Co Inc. | Armakleen M Aero NS | 5 | 73.75 | ☐ | |
| Church & Dwight Co Inc. | Armakleen M-400 | 5 | 28.61 | ☐ | |

Conclusion: The three supplied products have been tested on six soils. The M Aero was the only product to work on all six contaminants. The M Aero NS worked on all except the ink. With further cleaning time, the ink would have been removed by M Aero NS.