CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2004
DateRun:	05/12/2004
Experimenters:	Jason Marshall
ClientType:	Bicycle Manufacturer
ProjectNumber:	Project #1
Substrates:	Titanium
PartType:	Coupon
Contaminants:	Fluxes
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To evaluate cleaners on fifth supplied soil

Experimental Procedure:

Five cleaners were selected from the previous trial and three additional products were include based on past flux removal. The five cleaners from the previous trials were aqueous based and were diluted to 5% using DI water in 600 ml beakers and heated to 120 F on a hot plate. The Bio T Max was used at full strength heated to 120 F, the Inproclean 4000 T was used at 10% at 120 F and the Beyond 2009 was used at full strength at room temperature.

Twenty-four preweighed titanium coupons were coated with client supplied Wolverine Ultra Flux (1332-77-0, 10043-35-3, 7789-29-9, 11128-29-3, 151-21-3), using a hand held swab and then heated with a Master Appliance Heat Gun at 500 F for 10 minutes. Coupons were allowed to cool 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:

The five aqueous based products and the diluted Inproclean 4000 T removed over 98% of the flux. The other two semi-aqueous products had little success on the flux, removing under 65%. 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	0.6529	0.0007	99.89
	1.0526	0.0381	96.38
	0.8196	0.0014	99.83
Micro 90	0.5006	0.0002	99.96
	1.2334	0.0000	100.00
	1.0463	0.0002	99.98
Daraclean 282 GF	1.0000	-0.0001	100.01
	0.8427	0.0001	99.99
	0.7254	0.0003	99.96
Inproclean 3800	0.5834	0.0062	98.94
	0.3333	0.0002	99.94
	0.5946	0.0004	99.93
Beyond 2004	0.8883	-0.0002	100.02
	1.1494	0.0002	99.98
	0.8821	0.0004	99.95
Bio T Max	0.7241	0.3693	49.00
	1.0461	0.6287	39.90
	1.4041	0.8040	42.74
Inproclean 4000 T	1.1783	0.0124	98.95
	0.6237	0.0057	99.09
	0.5770	0.0075	98.70
Beyond 2009	0.4338	0.2126	50.99
	0.6664	0.2878	56.81
	0.6922	0.1863	73.09

Summary:

Substrates:	Titanium

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Contaminants:	Fluxes				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	5	98.70	☑	
International Products Corporation	Micro 90 Conc.	5	99.98	☑	
Magnaflux	Daraclean 282 GF	5	99.99	☑	
Oakite Products	Inproclean 3800	5	99.60	☑	
Today & Beyond	Beyond 2004	5	99.99	☑	
Bio Chem Systems	Bio T Max	100	43.88	☐	
Oakite Products	Inproclean 4000 T	10	98.91	☑	
Today & Beyond	Beyond 2009	100	60.30	☐	

Conclusion: Products will be tested on the remaining contaminant - permanent marker.