CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2007
DateRun:	10/17/2007
Experimenters:	Jason Marshall
ClientType:	Chemical Company
ProjectNumber:	Project #1
Substrates:	Aluminum
PartType:	Coupon
Contaminants:	Cutting/Tapping Fluids
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To evaluate supplied products on third requested contaminant.

Experimental Procedure:

Four products were diluted to the requested levels and heated to 135 F on a hot plate. In addition, water was used as a control solution. Eighteen preweighed Aluminum 6061 T6 coupons were coated with Blaser Vacomill 22 cutting oil using a handheld swab. Coupons were weighed a second time to determine the amount of cutting fluid added.

Three coupons were immersed in each solution and cleaned for five minutes using minimal stir-bar agitation. Coupons were rinsed in either DI water or tap water heated to 135 F. One product was rinsed in room temperature tap water as requested. All coupons were dried for 10 minutes in an oven at 140 F. After drying, coupons were weighed a third time and product cleaning efficiencies were calculated.

Requested Procedure:
A. General Process
Soaking for 5 minutes at 135 degrees F and rinsing for 5 minutes at a temperature selected in procedure B below. During the soaking and rinsing the solution should be gently stirred to simulate effect of typical continuous flow filtering in both cleaning and rinse tanks. Then dry thoroughly in drying oven of type that is typically used in precision cleaning applications. The rinse water should be changed after each set of 3 tests to prevent contaminant buildup.

B. FPC testing.
Mix FPC 100-add 7 oz of concentrate to 123 oz of filtered tap water when both are at room temperature. Then run process of A above with rinse tank at room temperature and repeat with rinse tank at 135 degrees F.

C. Other products
Use process A above. at dilutions shown but rinsing with DI water instead of tap water for the Metalnox M6440.

Products to Evaluate
Metalnox M6440 @ 10% solution
Extreme Simple Green Aircraft Cleaner@10% solution.
Gemtec Aircraft cleaner @ 15% solution.
Kleen Tec 715@ 1 part concentrate to 11 parts water

Results:

The same four products removed over 92% of the Blaser Vacomill 22 cutting oil. Water removed just under two-thirds of the lubricant. The FPC that was rinsed with room temperature water removed just over 80%. The table lists the amount of soil added, the amount remaining and the calculated efficiencies.

Cleaner	Initial wt	Final wt	% Removed
Metalnox M6410	0.3042	0.0017	99.44
	0.4746	0.0271	94.29
	0.3414	0.0377	88.96
SC Aircraft	0.3516	0.0258	92.66
	0.3401	0.0352	89.65
	0.3486	0.0145	95.84
KT 715	0.2809	0.0049	98.26
	0.4151	0.0069	98.34
	0.3416	0.0050	98.54
FPC 100	0.3773	0.0157	95.84
	0.2970	0.0144	95.15
	0.3452	0.0262	92.41
Water	0.1392	0.0565	59.41
	0.2871	0.1045	63.60

CLEANING LABORATORY EVALUATION SUMMARY

	0.2996	0.1106	63.08
FPC 100 cold rinse	0.3658	0.0734	79.93
	0.3327	0.0365	89.03
	0.2986	0.0628	78.97

Summary:

Substrates:	Aluminum
Contaminants:	Cutting/Tapping Fluids

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Kyzen Corporation	Metalnox M6440	10	94.23	☑	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	10	92.72	☑	
Klean Tec	KT 715	8.3	94.47	☑	
Environmental Solution Products Inc	FPC 100	5.4	94.47	☑	
Water	Water	100	62.03	☐	
Environmental Solution Products Inc	FPC 100	5.4	82.64	☐	cold rinse

Conclusion: The products will be tested on the final supplied contaminant following the requested procedures.