CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008

DateRun: 06/18/2008

Experimenters: Jason Marshall, Shweta Bansal

ClientType: Tool Manufacturer

ProjectNumber: Project #1

Substrates: Steel

PartType: Coupon

Contaminants: Lubricating/Lapping Oils

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate top products on the third supplied cutting fluid using ultrasonic cleaning.

Experimental Procedure: The top six products were selected from the previous lab trial. Each product was diluted to 5% using DI water in 600 ml glass beakers. Solutions were heated to 130 F on immersed in a heat bath in a Branson 40 kHz ultrasonic tank. Products were degassed for five minutes.

Eighteen preweighed steel coupons were coated with the ChemSearch Aerolex Plus moly dry film lubricant by spraying the contaminant onto the surface. Coupons were weighed a second time to determine the amount of soil added. Three coupons were immersed into each product and cleaned for 5 minutes using ultrasonic agitation. Following cleaning, coupons were rinsed for 15 seconds in tap water at 120 F and dried using air blow off for 30 seconds at room temperature. Final weights were recorded, and efficiencies were calculated.

Results: The aqueous products had difficulty removing the lubricant. One product had moderate success removing over 40% of the contaminant as determined by gravimetric analysis. The others had negative calculated removal even though the coupons showed visual signs of being cleaner. Visual estimates were made for lubricant removal in addition to the traditional gravimetric values.

The table lists the amount of soil added, the amount remaining after cleaning, the efficiency for each coupon cleaned and the visually estimated level of removal.

Cleaner	Initial wt	Final wt	% Removed	Visual Estimate	Average Estimate
M Aero	0.0637	0.0843	-32.34	30	
	0.0345	0.0382	-10.72	40	
	0.0313	0.0593	-89.46	30	33.33
Polyspray Jet 790 xs	0.0325	0.0504	-55.08	35	
	0.0435	0.0696	-60.00	50	
	0.0421	0.0533	-26.60	50	45.00
Metalnox M6310	0.0352	0.0298	15.34	30	
	0.0451	0.0409	9.31	50	
	0.0405	0.0475	-17.28	50	43.33
Daraclean 282 GF	0.0376	0.0347	7.71	50	
	0.0371	0.0344	7.28	50	
	0.0442	0.0453	-2.49	45	48.33
Micro 90	0.0696	0.0510	26.72	50	
	0.0468	0.0187	60.04	65	
	0.0413	0.0208	49.64	60	58.33
Luminox	0.0447	0.0946	-111.63	20	
	0.0328	0.0569	-73.48	40	
	0.0412	0.0627	-52.18	40	33.33

Summary:

Substrates:	Steel				
Contaminants:	Lubricating/Lapping Oils				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Church & Dwight Co Inc.	Armakleen M Aero	5	-44.17	☐	
US Polychem Corporation	Polyspray Jet 790 XS	5	-47.23		

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Kyzen Corporation	Metalnox M6310 (For Comparison Only)	5	2.46	☐	
Magnaflux	Daraclean 282 GF	5	4.17	☐	
International Products Corporation	Micro 90 Conc.	5	45.47	☑	
Alconox Inc	Luminox	5	-79.10	☐	

Conclusion: A follow up test will be conducted on this soil with additional products. The six products from this trial will still be used on the fourth soil.