CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2002
DateRun:	07/31/2002
Experimenters:	Jason Marshall
ClientType:	Metal
ProjectNumber:	Project #1
Substrates:	Copper
PartType:	Coupon
Contaminants:	Buffing/Polishing Compounds, Greases
Cleaning Methods:	Ultrasonics
Analytical Methods:	Gravimetric
Purpose:	To evaluate successful cleaners under ultrasonic energy
Experimental Procedure:	The eight successful cleaners from the previous trial were again diluted to 5% using DI water in 600 ml beakers and heated to 130 F on a hot plate. Solutions were then degassed for 5 minutes in a Crest 40 kHz ultrasonic tank. Twenty-four preweighed coupons were coated with coated with Jackson Lea Learok 7-S-3 Buffing compound (102-71-6, 14808-60-7, 1317-95-9). The buffing compound was applied by first heating it with a hot air gun and rubbing the coupons with the melted contaminant. Coupons were allowed to cool to room temperature and then weighed again. Three coupons were cleaned in each solution for 5 minutes using ultrasonic energy at 40 kHz. Following the cleaning, coupons were rinsed with a DI water bath for 30 seconds at room temperature and dried using a Master Appliance Heat Gun at 300 F for 15 seconds. Coupons were again allowed to cool to room temperature and then weighed a final time. Cleaning efficiencies were calculated and recorded.
Results:	Only two products, Permag S-4 and Micro 90 removed all of the buffing compound without any additional wiping action. However, it was noted that the buffing compound was again only loosely attached the coupons. When the coupons were wiped with a single pass using a paper towel, the remaining contaminant was removed easily. The following table lists the efficiencies calculated for both the initial Immersion test and the wipe analysis.

Cleaner	Initial wt of cont.	Final wt of cont.	%Cont Removed
Permag S-4	1.0714	0.0007	99.93
	1.7478	0.0006	99.97
	1.3386	0.0031	99.77
815 GD	1.4520	0.6673	54.04
	1.3156	0.7116	45.91
	0.8519	0.4219	50.48
Micro 90	1.2660	-0.0006	100.05
	1.3342	0.0002	99.99
	1.0181	0.0000	100.00
ND 17	1.4717	0.8485	42.35
	1.1798	1.2827	-8.72
	1.3983	0.9215	34.10
Inproclean 3800	1.1298	0.5082	55.02
	2.0867	1.4363	31.17
	0.8887	0.1345	84.87
Dirtex	1.2341	0.5514	55.32
	1.5249	1.0775	29.34
	1.1501	0.6131	46.69
Polychem Spray 790P	1.5179	1.7077	-12.50
	2.3515	2.5264	-7.44
	1.2234	1.3021	-6.43
Daraclean 282 GF	0.9261	0.3788	59.10
	1.3303	0.7860	40.92
	0.9001	0.1792	80.09

Summary:

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Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Magnuson Products	Permag S-4	5	99.89	☑	no wipe
Brulin Corporation	Formula 815 GD	5	99.94	☑	wipe
International Products Corporation	Micro 90 Conc.	5	100.01	☑	no wipe
MacDermid Industrial Products	ND 17	5	99.74	☑	with wipe
Oakite Products	Inproclean 3800	5	99.96	☑	with wipe
Savogran Company	Dirtex Prepaint Cleaner	5	99.80	☑	with wipe
US Polychem Corporation	Polyspray Jet 790 P	5	99.83	☑	with wipe
Magnaflux	Daraclean 282 GF	5	99.91	☑	with wipe

Conclusion: Two products were successful in removing the buffing compound with ultrasonics alone. Permag S-4 and Micro 90 will be compared directly under conditions similar to current cleaning setup of 1/2% solution and 1-2 minute cleaning time.