CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1995
DateRun:	07/05/1995
Experimenters:	Donald Garlotta, Jay Jankauskas
ClientType:	Plating Job Shop
ProjectNumber:	Project #1
Substrates:	Aluminum, Brass, Carbon Steel, Copper
PartType:	Coupon
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Waxes, Oil
Cleaning Methods:	Mechanical Agitation
Analytical Methods:	Black light, FTIR, Gravimetric
Purpose:	Test out the two new Oakite products

Experimental Procedure:

The Inproclean #2000 is a no foaming version of the Inproclean #3800. The Inproclean 61B is a powdered aluminum and steel cleaner.
The Inproclean #2000 will be used at 10% by volume concentration while 20 grams of Inproclean 61B will be dissolved in 500 ml of water. Cleaning will take place at 150 F for 20 minutes. The coupons will then be rinsed for 2 minutes in 150 F tap water and dried under air knives for 2 minutes and dried in a convection oven set at 120 F for one hour.
Gravimetric analysis will be used to estimate the removal of all four contaminants. The coupons will be observed under a black light to notice any residual wax or quench oil. FTIR will be used to notice any non-visible traces of waxes or oils.

SUBSTRATE MATERIAL: #1- 6061 Aluminum coupons, #2- 110 Copper Coupons, #3- 260 Brass Coupons, #4 Carbon Steel pieces
CONTAMINANTS: #1- Wax, #2- Tap magic cutting fluid, #3- SafeTap grinding lubricant, #4- CI Hayes Quench Oil
CONTAMINATING PROCESS USED: coupons were dipped in wax and the oils were applied with a swab.

Results:

Absolutely no foam, and very good wax and oil rejection. There was no etching on any of the coupons. As in all previous trials there is a slight bit of wax remaining on the coupons. Visually, all the oils were removed but a slight bit of Safetap was detected by the FTIR. Definitely need more mechanical energy to remove the wax residue. Increased air agitation with brushing should accomplish this.
Probably one of the best wax removers, but the Inproclean 61B foams up quite a bit and it etches the brass pretty bad, shouldn't be considered by Plating Job Shop.

EXPERIMENTAL DATA LOG

GRAVIMENTRIC ANALYSIS

Sample # and substrate	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
#4-Al	20.9807	21.7228	21.0077	0.7151	96.36%
#10-Al	20.9982	21.7389	21.0008	0.7381	99.65%
#3545-Cu	35.3483	36.0925	35.3498	0.7427	99.80%
#4076-Cu	35.4014	36.2451	35.4019	0.8432	99.94%
#4687-Br	34.4644	35.2208	34.4650	0.7558	99.92%
#4080-Br	34.4050	35.1950	34.4066	0.7884	99.80%
#23-Steel	128.7159	129.8784	128.7243	1.1541	99.28%
#69-Steel	152.9184	154.2190	152.9235	1.2955	99.61%
#18-Al	21.0125	22.4750	21.0126	1.4624	99.99%
#26-Al	21.0039	22.3597	21.0040	1.3557	99.99%
#5581-Cu	35.5524	36.5757	35.5524	1.0233	100.00%
#4509-Cu	35.4532	36.2085	35.4527	0.7558	100.07%
	34.4965	35.4915	34.4968	0.9947	99.97%

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#5054-Br					
#4459-Br	34.4373	35.3729	34.4364	0.9365	100.10%
#37-Steel	176.2809	178.4399	176.2828	2.1571	99.91%
#53-Steel	132.4426	133.8878	132.4431	1.4447	99.97%

Summary:

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Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Oakite Products	Inproclean 2000	10	99.65	☑	
Oakite Products	Inproclean 61 B	5	99.99	☐	

Conclusion: The Oakite Inproclean #2000 is probably the most promising of the cleaners tested to date. Need to further test for Plating Job Shop next week.