CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2002
DateRun:	08/06/2002
Experimenters:	Jason Marshall
ClientType:	Electronics Manufacturer
ProjectNumber:	Project #2
Substrates:	Aluminum
PartType:	Coupon
Contaminants:	Fluxes, Resins/Rosins, Solder
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To evaluate possible replacement cleaners for NPB in solder cleaning from electronics
Experimental Procedure:	Eight products were selected from the laboratories database based on client information and past successful testing. The solutions were used at 68 F. The four semi-aqueous products were used at full strength and the aqueous based products were diluted to 10% in 600 ml beakers using DI water. Twenty-four preweighed coupons were coated with Alpha Metals 615 Flux (67-63-0, 8052-41-3, 8050-09-7) using a handheld swab and allowed to dry. Coupons were then reweighed. Three coupons were cleaned in each solution for 5 minutes using stir-bar agitation, then rinsed in tap water at 68 F for 15 seconds followed by an air knife drying for 30 seconds. Once dry, final weights were recorded and efficiencies were calculated.
Results:	Five of the eight cleaners removed over 90% of the flux from the aluminum coupons using stir-bar agitation. Two removed between 85-90% and only Ozzy Juice SW 3 had difficulty removing the flux. Table 1 below lists the calculated efficiencies for each coupon cleaned.

Table 1. Calculated Efficiencies

Cleaner	Initial wt of cont.	Final wt of cont.	%Cont Removed
Bio T Max	0.0264	0.0017	93.56
	0.0613	0.0010	98.37
	0.0794	0.0008	98.99
DBE 3	0.0983	0.0048	95.12
	0.1131	0.0124	89.04
	0.1167	0.0190	83.72
DS 108	0.0706	-0.0002	100.28
	0.1416	0.0011	99.22
	0.1045	-0.0006	100.57
Ionox HC 2	0.1485	0.0067	95.49
	0.0848	0.0022	97.41
	0.1057	0.0009	99.15
Ozzy Juice SW3	0.1283	0.1186	7.56
	0.0837	0.0774	7.53
	0.1571	0.1527	2.80
Armakleen E 2002	0.1277	0.0368	71.18
	0.1163	0.0142	87.79
	0.0778	0.0057	92.67
SWR One	0.1108	-0.0004	100.36
	0.1123	-0.0005	100.45
	0.0846	-0.0008	100.95
Beyond 2005	0.0911	-0.0001	100.11
	0.1300	0.0004	99.69
	0.1038	-0.0008	100.77

Summary:

Substrates:	Aluminum
Contaminants:	Fluxes, Resins/Rosins, Solder

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Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Today & Beyond	Beyond 2005	10	100.19	☑	
Dysol	DS 108 Wipe Solvent	100	100.03	☑	
Bio Chem Systems	Bio T Max	100	96.97	☑	
Church & Dwight Co Inc.	Armakleen E 2002	10	83.88	☐	
SWR Corporation	SWR One	10	100.58	☑	
Chem Free Corporation	SW-3 Ozzy Juice (Improved Low Odor)	10	5.96	☐	
Kyzen Corporation	Ionox HC 2	100	97.35	☑	
Invista S.a.r.l	Flexisolv DBE 3 ester	100	89.29	☐	

Conclusion: The top five cleaners will be used in the next trial using ultrasonic energy. Cleaning times will decrease to 2 minutes. All other parameters will be kept the same.