CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2002

DateRun: 10/23/2002

Experimenters: Jason Marshall, Heidi Wilcox

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Steel

PartType: Coupon

Contaminants: Fluxes, Greases, Paints, Waxes

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate supplied cleaner on four additional contaminants.

Experimental Procedure: The supplied product was used at full strength at room temperature. The product was poured into four 600 ml beakers. The four contaminants were applied onto sets of three coupons using a hand held swab. Contaminants were allowed to dry and then weighed again using the Denver Instruments A250 balance. One set of contaminated coupons were cleaned in the beakers for 5 minutes using stir-bar agitation. Coupons were dried using tap water at room temperature for 15 seconds and dried using a Master Appliance Heat Gun (except wax) at 500 F for 30 seconds. Once coupons were dry, final weights were recorded and efficiencies were calculated.

Contaminants: Grease - Daubert Chemical Co Tectyl 891 Class I cosmoline grease (8052-41-3, 68918-69-4, 64742-65-0, 68608-26-4)
Flux - Alpha 615 RMA flux (67-63-0, 8052-41-3, 8050-09-7)
Paint - Glidden Paint Company Ultra Hide Alkyd semi gloss paint (136-52-7, 1317-65-3, 1332-58-7, 66402-68-4, 8052-41-3, 64742-88-7, 71-43-2, 13463-67-7, 68604-95-5, 66070-62-0, 67746-05-8)
Wax - Stevenson Brothers and Co. Inc. Petroleum Paraffin wax.

Results: Only the flux was removed during the immersion cleaning testing. Both the paint and the Tectyl 891 showed some signs of removal. The wax was not effected by the cleaning process. The table below lists the efficiencies for each coupon.

Table 1. Efficiencies

	Cleaner	Coupon 1	Coupon 2	Coupon 3	Average
Immersion	Cosmoline	17.81	39.39	32.73	29.98
	Flux	100.22	99.81	95.81	98.61
	Paint	16.36	13.52	34.50	21.46
	Wax	-0.51	-0.86	0.12	-0.42

Summary:

Substrates:	Steel				
Contaminants:	Fluxes, Greases, Paints, Waxes				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Metabolix Inc	Metabolix E3HB	100	29.98	☐	Grease-cosmoline
Metabolix Inc	Metabolix E3HB	100	98.61	☑	Flux
Metabolix Inc	Metabolix E3HB	100	21.46	☐	Paint
Metabolix Inc	Metabolix E3HB	100	-0.42	☐	Wax

Conclusion: The same four contaminants will be evaluated for removal using ultrasonic energy.