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: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate supplied cleaner on four contaminants using ultrasonic energy

Experimental Procedure: The supplied product was used at full strength at room temperature. The product was poured into four 600 ml beakers and degassed for 5 minutes using a Crest 40 kHz ultrasonic tank. 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 2 minutes using ultrasonic energy. 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: Again, the flux was easily removed from the steel coupons within the 2 minutes of cleaning. The paint removal was increased from 21% to over 84%. The cosmoline cleaning was slightly improve using ultrasonics whereas the wax showed no signs of improvement. Table 1 lists the efficiencies for the coupons cleaned in ultrasonics.

Table 1. Ultrasonic Efficiencies

Ultrasonics	Cosmoline	55.23	35.15	17.66	36.01
	Flux	100.63	101.06	99.76	100.48
	Paint	85.10	90.31	76.72	84.05
	Wax	2.07	-10.54	0.34	-2.71

Summary:

Substrates:	Steel				
Contaminants:	Fluxes, Greases, Paints, Waxes				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Metabolix Inc	Metabolix E3HB	100	36.01	☐	Grease - cosmoline
Metabolix Inc	Metabolix E3HB	100	100.42	☑	Flux
Metabolix Inc	Metabolix E3HB	100	84.05	☑	Paint
Metabolix Inc	Metabolix E3HB	100	-2.71	☐	Wax

Conclusion: The supplied cleaner was successful on two of the four contaminants with the addition of ultrasonics. Cosmoline removal may be increased by the addition of temperature or longer cleaning times. From the data, wax removal does not appear to be a practical use for the supplied product.