CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999

DateRun: 06/28/1999

Experimenters: Jason Marshall

ClientType: Metal Working

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate current cleaners for all three contaminants and three cleaners from previous testing on the last contaminant.

Experimental Procedure: The client supplied cleaner was made into solution following the clients recommendations. The other three cleaners were diluted to 5% by volume in 400 mL Pyrex beakers and heated to 130 F on a hot plate. Table 1 lists the cleaners selected and the dilutions used. Nine preweighed coupons were contaminated with the Tower oil and weighed again. Three coupons were contaminated with the Tuf Draw and three with the Lubricant mix.

The Tuf Draw and Lubricant mix coupons were cleaned using the client supplied cleaner mix using stir-bar-agitation for five minutes. Coupons were rinsed in 120 F tap water for 30 seconds and dried using a Master Appliance Corp, Hot-air gun model HG-301A for one minute at 500 F. After cooling to room temperature, final weights were recorded and cleaning efficiencies were calculated. The Tower Oil product was cleaned by all four cleaning products using the same parameters.

SUBSTRATE MATERIAL: Aluminum Coupons (5052)
CONTAMINANTS: Tuf Draw Vanishing Film 2889 (CAS #: 64741-65-7); Lubricant Mix [Hydroil AW-3 (petroleum hydrocarbon), Express Gear Lubricant F]; Tower Oil & Technology Company LS-H-213 (CAS #: 8052-41-3)
CONTAMINATING PROCESS USED: Coupons were coated with separate contaminants using a hand held swab.

Results: The client supplied cleaner removed the two machining fluids easily but had difficulty in removing the lubricant mix. All four cleaners were able to remove the Tower oil product from the coupons. Table 2 lists the results of the cleaning.

Table 2. Cleaning Efficiencies

	Chem Crest/ Almet B	Calgon	US Polychem	Oakite		
	Tower	Lube Mix	Tuf Draw	Tower	Tower	Tower
Coupon 1	100.32	87.15	100.76	100.77	101.26	99.79
Coupon 2	100.54	91.99	100.57	100.05	101.24	99.68
Coupon 3	100.76	78.57	100.50	99.72	99.70	99.16
Average	100.54	85.90	100.61	100.18	100.73	99.54

Summary:

Substrates:	Aluminum				
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Oakite Products	Inproclean 3800	5	99.54	☑	
US Polychem Corporation	Polyspray Jet 790 XS	5	100.73	☑	
Calgon Corporation	SMS 206 K	5	100.18	☑	

Conclusion: The client supplied cleaner had difficulty in removing the lubricant mix. The other two contaminants were completely removed after the five minute cleaning. The three products from the previous trial were also capable of removing all of the Tower Oil product.