CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008

DateRun: 10/09/2008

Experimenters: Jason Marshall

ClientType: Electronics Manufacturer

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate top four products on the last supplied contaminant using immersion cleaning.

Experimental Procedure: The top four products based on past testing results were again diluted to 5% using DI water in 400 ml beakers. All four were heated to 130 F on a hot plate. Peweighed aluminum coupons were coated with the StarChem StarSol 775 AL metalworking fluid (64742-52-5, 102-71-6, 141-43-5, 4719-04-4) using a handheld swab. The contaminant was allowed to dry for about 10 minutes. Once dry, the coupons were weighed a second time to determine the amount of oil applied.

Three coupons were immersed into each solution and cleaned for 5 minutes using stir-bar agitation. Rinsing was performed for 15 seconds using tap water heated to 120 F and followed by 30 seconds of air blow off with dry compressed air at room temperature. Final weights were recorded, and efficiencies were calculated for each coupon cleaned.

Results: Three of the products were effective at removing the metalworking fluid from the aluminum coupons within 5 minutes of immersion cleaning. These 3 removed more than 92% of the metalworking fluid. The other product removed 81%. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

Cleaner	Initial wt	Final wt	% Removed
Green Soak	0.1821	0.0201	88.96
	0.1345	0.0342	74.57
	0.0623	0.0126	79.78
Shopmaster LpH	0.1189	0.0069	94.20
	0.2608	0.0158	93.94
	0.0794	0.0088	88.92
SC Aircraft & Metal Cleaner	0.1806	0.0080	95.57
	0.2533	0.0043	98.30
	0.1026	0.0019	98.15
Amberclean L12	0.1814	0.0018	99.01
	0.0691	0.0022	96.82
	0.1288	0.0029	97.75

Summary:

Substrates:	Aluminum				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
BCS Company	Green Spray 400	5	81.10	☐	
Buckeye International	Shopmaster LPH	5	92.35	☑	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	5	97.35	☑	
Innovative Organics Inc	Amberclean L 12	5	97.86	☑	

Conclusion: The three lab selected products were found to have good removal of all five soils using heated immersion cleaning. The client supplied product was moderately successful on all five soils. The addition of mechanical energy, either ultrasonics or spray washing, may be enough to improve the products efficiency on the more challenging soils.