CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008

DateRun: 10/08/2008

Experimenters: Jason Marshall, Junhee Cho

ClientType: Electronics Manufacturer

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate top six products on third supplied contaminant using immersion cleaning.

Experimental Procedure: The top six products based on past testing results were again diluted to 5% using DI water in 400 ml beakers. All six products were heated to 130 F on a hot plate. Peweighed aluminum coupons were coated with the Hagsterfer's Crystal Brite EDM oil 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: All six products were effective at removing the EDM oil from the aluminum coupons within 5 minutes of immersion cleaning. Five of the six removed over 99% of the EDM fluid. The sixth removed over 97%. 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	0.1438	-0.0032	102.23
	0.1488	-0.0015	101.01
	0.1299	-0.0017	101.31
Shopmaster LpH	0.1456	-0.0002	100.14
	0.1616	-0.0001	100.06
	0.1559	0.0004	99.74
FPC 100	0.1695	0.0003	99.82
	0.1720	0.0002	99.88
	0.1808	0.0001	99.94
SC Aircraft & Metal Cleaner	0.1720	0.0062	96.40
	0.1774	-0.0009	100.51
	0.1890	-0.0002	100.11
Amberclean L12	0.1733	0.0000	100.00
	0.1606	0.0017	98.94
	0.1917	0.0003	99.84
Ozzy Juice SW-3	0.1952	0.0042	97.85
	0.1989	0.0048	97.59
	0.1579	0.0043	97.28

Summary:

Substrates:	Aluminum
Contaminants:	Oil

Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
BCS Company	Green Spray 400	5	101.51	☑	
Buckeye International	Shopmaster LPH	5	99.98	☑	
Environmental Solution Products Inc	FPC 100	5	99.88	☑	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	5	99.00	☑	

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Innovative Organics Inc	Amberclean L 12	5	99.59	☑	
Chem Free Corporation	SW-3 Ozzy Juice (Improved Low Odor)	5	97.57	☑	

Conclusion: The top products will be evaluated on the fourth supplied contaminant under the same cleaning conditions.