CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008

DateRun: 01/30/2008

Experimenters: Jason Marshall

ClientType: Electronics Manufacturer

ProjectNumber: Project #1

Substrates: Copper

PartType: Coupon

Contaminants: Cutting/Tapping Fluids

Cleaning Methods: Mechanical Agitation

Analytical Methods: Gravimetric

Purpose: To evaluate products on second supplied cutting fluid.

Experimental Procedure: The six products were selected based on effectiveness on the previous two trials. All six products and one of the client supplied solvents were used at full strength in 250 ml beakers at room temperature.

Twenty-one preweighed coupons were coated with Master Chemical Corporation Trim Sol sf (8002-05-9, 61789-85-3, 68410-99-1, 68991-48-0, 68603-15-6) cutting fluid using a handheld swab. The contaminated coupons were weighed a second time to determine the amount of soil added. Three coupons were immersed into each cleaning solution and manual raised and lowered in the cleaning solution to provide minimal mechanical agitation. After one minute of cleaning, the coupons were removed and dried for 30 seconds using compressed air at room temperature. Following air drying, the coupons were weighed a final time to determine the amount of soil remaining. Efficiency for each coupon was determined and average cleaning results for each product were calculated.

Results: Three products removed over 90% of the cutting fluid within one minute. Two more products removed over 80%. Only one product was not successful in removing the second cutting fluid. The table below lists the amount of soil added, the amount remaining and the affiance for each coupon cleaned.

Cleaner	Initial wt	Final wt	% Removed
Shopmaster RC	0.1374	0.0130	90.54
	0.0677	0.0171	74.74
	0.1189	0.0220	81.50
Soy Clear 1500	0.1412	0.0126	91.08
	0.0774	0.0402	48.06
	0.0991	0.0297	70.03
Ionox HC 2	0.1254	0.0074	94.10
	0.0672	0.0164	75.60
	0.1175	0.0103	91.23
Solsafe 245	0.1576	0.0005	99.68
	0.1621	0.0000	100.00
	0.2679	0.0002	99.93
SC Actisolv	0.1769	0.0103	94.18
	0.2246	0.0128	94.30
	0.0950	0.0095	90.00
DS 104	0.1797	0.0002	99.89
	0.0977	0.0005	99.49
	0.1842	0.0005	99.73
BioSpirits 8020	0.2779	0.0189	93.20
	0.1027	0.0179	82.57
	0.1653	0.0138	91.65

Summary:

Substrates:	Copper
Contaminants:	Cutting/Tapping Fluids

Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Buckeye International	Shopmaster RC	100	82.26	☑	
AG Environmental Products	Soy Clear 1500	100	69.72	☐	
Kyzen Corporation	Ionox HC 2	100	86.98	☑	

CLEANING LABORATORY EVALUATION SUMMARY

Bio Chem Systems	Solsafe 245	100	99.87	☑	
Gemtek Products	SC Actisolv Safety Solvent	100	92.83	☑	
Dysol	DS 104 Wipe Solvent	100	99.70	☑	
Lihac Eaton Inc	Biospirits 8020	100	89.14	☑	

Conclusion: Three products worked better the previously used solvent and two others performed almost as well. The top products will be used on supplied parts.