CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2008
DateRun:	01/28/2008
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 laboratory selected products for the removal of the supplied cutting oil and compare to current cleaning solvents.
Experimental Procedure:	Eight potential products were identified using the lab's on-line database, www.cleanersolutions.org, based on supplied client information. Two supplied products were included in testing to establish baseline. All ten products were used at full strength in 250 ml beakers at room temperature. Thirty preweighed coupons were coated with Hangsterfer Laboratories Hard Cut 5418 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:	Two of the ten products were very effective in removing over 95% of the cutting fluid using minimal agitation. These two products, Solsafe 245 and DS 104 were both more effective than two supplied Bio Spirits products. Another four products removed over 80%. Two of these, Ionox HC2 and SC Actisolv, were as effective as the Bio Spirits 1000. The table lists the amount of cutting fluid added, the amount remaining and the efficiency for each coupon.

Cleaner	Initial wt	Final wt	% Removed
Optisolv 7171	0.1120	0.0452	59.64
	0.1175	0.0449	61.79
	0.1620	0.0491	69.69
Ionox HC2	0.2804	0.0335	88.05
	0.1225	0.0335	72.65
	0.1201	0.0228	81.02
Solsafe 245	0.2684	0.0048	98.21
	0.0818	0.0099	87.90
	0.2229	0.0022	99.01
D Greeze 500 Lo	0.1831	0.0227	87.60
	0.0490	0.0235	52.04
	0.1452	0.0132	90.91
SC Supersolve	0.1206	0.0334	72.31
	0.1602	0.0380	76.28
	0.1422	0.0264	81.43
SC Actisolv	0.2199	0.0314	85.72
	0.0999	0.0324	67.57
	0.2812	0.0313	88.87
Organic C/D	0.1311	0.0419	68.04
	0.1620	0.0424	73.83
	0.2825	0.0619	78.09
DS 104	0.2068	0.0034	98.36
	0.2210	0.0041	98.14
	0.1832	0.0039	97.87
Bio Spirits 8020	0.2241	0.0139	93.80
	0.2251	0.0212	90.58
	0.2933	0.0251	91.44

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Bio Spirits 1000	0.1607	0.0309	80.77
	0.2684	0.0334	87.56
	0.1939	0.0523	73.03

Summary:

Substrates:	Copper
Contaminants:	Cutting/Tapping Fluids

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Kyzen Corporation	Optisolv OP7171	100	63.71	☐	
Kyzen Corporation	Ionox HC 2	100	80.57	☑	
Bio Chem Systems	Solsafe 245	100	95.04	☑	
Transene Company, Inc.	D Greeze 500 LO	100	76.85	☐	
Gemtek Products	SC Supersolve Safety Solvent	100	76.67	☐	
Gemtek Products	SC Actisolv Safety Solvent	100	80.72	☑	
1st Envirosafety Inc. - No Longer Exists	Organic Cleaner/Degreaser - For Comparison Purposes Only	100	73.32	☐	
Dysol	DS 104 Wipe Solvent	100	98.12	☑	
Lihac Eaton Inc	Biospirits 8020	100	91.94	☑	Current product
Lihac Eaton Inc	Biospirits 1000	100	80.45	☑	

Conclusion:

Two selected products outperformed both the supplied cleaning products. An additional two products were as effective as one of the current solvents. Follow up testing will be conducted on some of the supplied parts under similar conditions.