CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2002

DateRun: 02/20/2002

Experimenters: Jason Marshall

ClientType: Electromagnetic Manufacturer

ProjectNumber: Project #3

Substrates: Sterling/Silver

PartType: Part

Contaminants: Lubricating/Lapping Oils

Cleaning Methods: Ultrasonics

Analytical Methods: OSEE

Purpose: To evaluate cleaners on supplied parts under operating conditions

Experimental Procedure: Cleaners from previous trial were selected for testing. Each was diluted to 5% using DI water in 600 ml beakers. Water was used as a control. The solutions were heated to 140 F in a Crest 25 kHz ultrasonic tank.

Four, 3 inch pieces of silver tape were cut from the supplied materials. Optically Stimulated Electron Emission (OSEE) readings were recorded to establish a baseline. Then each piece of tape was thinly coated with Atofina Copperskin 510 metal working compound (CAS#s: 64742-52-5, 123-95-5, 8016-28-2, 8002-13-9) . The contaminant was applied with a hand held swab and then wiped with a second tissue to simulate the amount of contaminant present after the drawing process. A second set of readings were recorded to determine the effect of the drawing compound on the OSEE readings of the silver tape. Next, each piece of tape was cleaned in a solution for two 1 second intervals and rinsed in a ultrasonic DI water bath for 1 second. Parts were dried for 10 second using a heat gun at 500 F. Final OSEE readings were recorded and compared to the dirty and baseline levels to determine cleanliness.

Results: The average OSEE readings measured for the each initial set was found to be 914. The average dirty reading was found to be 410. Comparing the final readings for each of the cleaners revealed that only one cleaner was completely successful in removing the oil, Oakite Inproclean 3800. Three others had readings in the 700 and one had a reading just above the average dirty reading. The following table lists the readings for each cleaner.

Cleaner		Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Average
BCS	Initial	965	975	977	973	978	979	974
	Dirty	524	305	322	251	524	370	383
	Clean	567	878	497	540	959	849	715
Brulin	Initial	978	930	974	979	978	972	968
	Dirty	583	378	508	431	713	332	491
	Clean	959	958	687	368	897	241	685
Houghton	Initial	979	978	830	968	896	973	937
	Dirty	444	453	696	783	862	543	630
	Clean	785	964	154	264	331	388	481
Oakite	Initial	881	800	618	939	972	967	863
	Dirty	669	241	735	541	378	377	490
	Clean	966	945	968	964	802	967	935
Sunshine	Initial	978	968	971	964	956	966	967
	Dirty	378	118	755	279	246	169	324
	Clean	963	962	302	527	968	966	781
Today	Initial	578	702	647	822	974	927	775
	Dirty	91	157	81	63	343	102	140
	Clean	957	967	459	964	960	466	796

Summary:

Substrates:	Sterling/Silver				
Contaminants:	Lubricating/Lapping Oils				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
BCS Company	251 SR	5	0.00	☐	oil spots
Brulin Corporation	Aquavantage 1400	5	0.00	☐	oil spots
Houghton International	MTC 53	5	0.00	☐	oil spots

CLEANING LABORATORY EVALUATION SUMMARY

Oakite Products	Inproclean 3800	5	0.00	☑	
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	5	0.00	☐	
Today & Beyond	Beyond 2005	5	0.00	☐	

Conclusion: The Oakite product was the only one to work under these conditions. The three products with OSEE readings in the 700's (BCS, Sunshine Makers and Today & Beyond) would probably work with an additional 2 seconds of cleaning. The six pieces have been sent back for further analysis.