CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2004
DateRun:	05/05/2004
Experimenters:	Jason Marshall
ClientType:	Jewelry Mfr
ProjectNumber:	Project #2
Substrates:	Sterling/Silver
PartType:	Coupon
Contaminants:	Oil
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To evaluate products on fourth supplied contaminant
Experimental Procedure:	Seven products were selected based on success in previous two trials as well as three new products. The seven products were used at full strength in a 250 ml beaker and heated to 96 F on a hot plate. The new products were used at room temperature due to lower flash points. Thirty preweighed silver plated copper coupons were coated with the Houghton International Cindol 3401 oil (64742-46-7) using a hand held swab. Coupons were weighed a second time to determine the amount of soil added to each coupon. Three coupons were cleaned in each solution for 5 minutes using stir-bar agitation. After cleaning parts were weighed a final time and efficiencies were calculated.
Results:	All ten products remove over 93% of the oil within five minutes of cleaning. Seven removed over 98% and four removed over 99%. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

Cleaner	Initial wt	Final wt	% Removed
HFE 7100	0.0489	0.0006	98.77
	0.0637	0.0004	99.37
	0.0590	0.0018	96.95
AK 225	0.0718	0.0048	93.31
	0.0651	0.0046	92.93
	0.0651	0.0032	95.08
Vertrel CCA	0.0922	0.0009	99.02
	0.0461	0.0009	98.05
	0.0872	0.0005	99.43
Ensolv	0.0858	0.0031	96.39
	0.0358	0.0029	91.90
	0.0769	0.0032	95.84
Metalnox M6760	0.0624	0.0014	97.76
	0.0760	0.0013	98.29
	0.0398	0.0000	100.00
Solvon PB	0.0391	0.0001	99.74
	0.1009	0.0002	99.80
	0.0443	-0.0001	100.23
Solvon IP	0.0803	0.0004	99.50
	0.0791	0.0001	99.87
	0.0410	-0.0002	100.49
OS 10	0.0797	0.0004	99.50
	0.0922	0.0005	99.46
	0.1000	-0.0003	100.30
OS 20	0.0649	-0.0006	100.92
	0.0976	-0.0005	100.51
	0.0644	-0.0006	100.93
OS 30	0.0376	0.0033	91.22
	0.1002	0.0055	94.51
	0.0533	0.0009	98.31

Summary:

Substrates:	Sterling/Silver

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Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
3M	HFE 7100	100	98.36	☑	
AGA Chemical	AK 225	100	93.78	☑	
DuPont	Vertrel CCA	100	98.83	☑	
Enviro Tech International Inc	Ensolv	100	94.71	☑	
Kyzen Corporation	Metalnox M6960	100	98.68	☑	
Poly Systems USA Inc	Solvon Kreussler PB	100	99.92	☑	
Poly Systems USA Inc	Solvon Kreussler IP	100	99.95	☑	
Dow Chemical Company	OS 10	100	99.75	☑	
Dow Chemical Company	OS 20	100	100.79	☑	
Dow Chemical Company	OS 30	100	94.68	☑	

Conclusion: A follow up trial will be conducted on the first contaminant to evaluate five products.