CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004

DateRun: 05/02/2004

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 identify alternative to TCE in vapor degreasing operation. Evaluation of products on first soil

Experimental Procedure: Ten products were selected based on client request for vapor degreasing solvents. Each product was used at full strength in a 250 ml beaker and heated to 96 F on a hot plate. Thirty preweighed silver plated copper coupons were coated with the Exxon Mobil Vacmul 03D (94741-44-2) 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: Seven of the ten products removed over 89% of the soil within five minutes using immersion cleaning. Two products, Flux Remover C and Heavy Duty Degreaser C, removed less than 60% and Vertrel MCA removed just under 80%. The table below lists the amount of soil added, the amount remaining after cleaning and efficiencies for each coupon cleaned.

Cleaner	Initial wt	Final wt	% Removed
HFE 7100	0.0283	0.0018	93.64
	0.0906	0.0078	91.39
	0.0960	0.0044	95.42
HFE 7200	0.0445	0.0053	88.09
	0.0455	0.0051	88.79
	0.0679	0.0063	90.72
AK 225	0.0926	0.0038	95.90
	0.0799	0.0025	96.87
	0.0497	0.0023	95.37
Vertrel CCA	0.0955	0.0031	96.75
	0.1159	0.0016	98.62
	0.0858	0.0017	98.02
Vertrel MCA	0.0581	0.0146	74.87
	0.0563	0.0177	68.56
	0.1140	0.0097	91.49
Flux Remover C	0.0530	0.0320	39.62
	0.1081	0.0695	35.71
	0.0773	0.0557	27.94
Heavy Duty Degreaser C	0.1056	0.0120	88.64
	0.0707	0.0330	53.32
	0.0556	0.0374	32.73
Ensolv	0.0592	0.0030	94.93
	0.1291	0.0034	97.37
	0.0804	0.0024	97.01
Ensolv A	0.1173	0.0025	97.87
	0.1112	0.0026	97.66
	0.0558	0.0026	95.34
Metalnox M6760	0.0838	0.0022	97.37
	0.0582	0.0027	95.36
	0.0851	0.0029	96.59

Summary:

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Substrates:	Sterling/Silver
Contaminants:	Oil

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
3M	HFE 7100	100	93.48	☑	
3M	HFE 7200	100	89.20	☑	
AGA Chemical	AK 225	100	96.05	☑	
DuPont	Vertrel CCA	100	97.80	☑	
DuPont	Vertrel MCA	100	78.31	☐	
Micro Care	Flux Remover C	100	34.42	☐	
Micro Care	Heavy Duty Degreaser C	100	58.23	☐	
Enviro Tech International Inc	Ensolv	100	96.44	☑	
Enviro Tech International Inc	Ensolv A	100	96.96	☑	
Kyzen Corporation	Metalnox M6960	100	96.44	☑	

Conclusion: The seven successful products will be used on the second supplied oil under the same conditions.