CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004

DateRun: 04/12/2004

Experimenters: Jason Marshall, Parvathy Vijayan Babu

ClientType: Capacitor Manufacturer

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate selected vapor degreasing solvents on first oil.

Experimental Procedure: Six 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. Eighteen preweighed aluminum coupons were coated with the Soltex Polybutene 32 (9003-29-6) 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: Four of the products, 71DE, AK 225, CCA and MCA, removed over 94% of the soil in the five minutes of immersion cleaning. The other two products removed less than 20%. Even after increasing cleaning time to ten minutes, these two products had only marginal success, removing less than 40%. The table below lists the amount of soil added, remaining and efficiencies for each coupon cleaned.

Cleaner	Initial wt	Final wt	% Removed
HFE 7100	0.6255	0.4415	29.42
	0.3452	0.3569	-3.39
	0.5307	0.5216	1.71
HFE 7200	0.2486	0.2254	9.33
	0.4331	0.38	12.26
	0.4522	0.2914	35.56
HFE 71DE	0.4494	0.0091	97.98
	0.3842	0.0171	95.55
	0.4593	0.0062	98.65
AK 225	0.3207	0.0157	95.10
	0.5828	0.0309	94.70
	0.5086	0.0393	92.27
HFE 7100 (10 min)	0.6255	0.4209	32.71
	0.3452	0.3468	-0.46
	0.5307	0.4635	12.66
HFE 7200 (10 min)	0.2486	0.2059	17.18
	0.4331	0.2221	48.72
	0.4522	0.2140	52.68
CCA	0.8681	0.0234	97.30
	0.5975	0.0041	99.31
	1.0897	0.0532	95.12
MCA	0.4396	0.0211	95.20
	1.0074	0.0182	98.19
	0.6466	0.0126	98.05

Summary:

Substrates:	Aluminum				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
3M	HFE 7100	100	9.25	☐	at 10 min = 14.97%

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3M	HFE 7200	100	19.05	☐	at 10 min = 39.52%
3M	HFE 71DE	100	97.39	☑	
AGA Chemical	AK 225	100	94.03	☑	
DuPont	Vertrel CCA	100	97.25	☑	
DuPont	Vertrel MCA	100	97.15	☑	

Conclusion: Longer cleaning time (30 minutes) may help to improve the effectiveness of 7100 and 7200. Increasing the temperature of all the products could also improve the removal of this soil. All six products will be tested on the second supplied soil.