

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004  
 DateRun: 04/16/2004  
 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 cleaners on second supplied contaminant

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 Cargill, Inc Canola Oil (120962-03-0) 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 allowed to sit for 10 minutes for drying at room temperature. The coupons were weighed a final time and efficiencies were calculated.

Results: Two of the six products were successful in removing over 85% of the soil in five minutes of immersion. Many of the coupons were found to have residual oil on the back side of the coupons. This resulted when coupons were removed from the beakers (dragging through accumulated oil on the surface). 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	0.0723	0.0514	28.91
	0.1305	0.0503	61.46
	0.1846	0.0547	70.37
HFE 7200	0.1328	0.0754	43.22
	0.1749	0.0853	51.23
	0.1551	0.0427	72.47
HFE 71DE	0.1406	0.0202	85.63
	0.1542	0.0221	85.67
	0.1537	0.0183	88.09
AK 225	0.1825	0.0803	56.00
	0.2454	0.0690	71.88
	0.1676	0.0135	91.95
Vertrel CCA	0.1427	0.0426	70.15
	0.1321	0.0094	92.88
	0.1795	0.0070	96.10
Vertrel MCA	0.1571	0.0333	78.80
	0.1153	0.0297	74.24
	0.1250	0.0233	81.36

Summary:

<b>Substrates:</b>		Aluminum			
<b>Contaminants:</b>		Oil			
Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
3M	HFE 7100	100	53.58	<input type="checkbox"/>	
3M	HFE 7200	100	55.64	<input type="checkbox"/>	
3M	HFE 71DE	100	86.46	<input checked="" type="checkbox"/>	
AGA Chemical	AK 225	100	73.28	<input type="checkbox"/>	Residue on back
DuPont	Vertrel CCA	100	86.38	<input checked="" type="checkbox"/>	Residue on back
DuPont	Vertrel MCA	100	78.13	<input type="checkbox"/>	Residue on back

Conclusion: The same products will be tested on the third supplied oil under the same conditions.