CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2007

DateRun: 02/07/2007

Experimenters: Jason Marshall

ClientType: Consultant

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Coatings

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate four binary azeotropes for removing a polybutene coating from aluminum coupons using immersion cleaning.

Experimental Procedure: The four supplied solvents were mixed with DI water in 600 ml beakers to obtain binary azeotropes. Methyl Acetate (MeOAc) was mixed with water (95% water) and heated to 56.1 C on a hot plate. T-Butyl Acetate (t-BAc) was mixed with water (16.5% water) and heated to boiling at 87.4 C. Propylene Glycol Methyl Ether (PGME) was mixed with water (51% water) and heated to 97.5 C. The final blend consisted of Heptane mixed with water (12.9% water) and heated to 79.2 C.

Twelve preweighed aluminum coupons were coated with Soltex Polybutene 32 (9003-29-6) with a handheld swab. Coupons were weighed again to determine the amount of oil applied. Three coupons were cleaned in each azeotrope for five minutes at the boiling point, rinsed for 15 seconds in 120 F tap water and dried for 30 seconds using compressed air at room temperature. Coupons were weighed a third time to determine the amount of oil remaining. Efficiencies were calculated and recorded.

Results: Again, two of the four azeotropes removed over 98% of the canola oil. The table lists the amount of soil added, the amount remaining, and the efficiency of each coupon cleaned.

Azeotrope	Initial wt	Final wt	% Removed
MeOAc	0.9602	1.0009	-4.24
	0.7028	0.6663	5.19
	0.8136	0.8085	0.63
t-BAc	0.7825	0.0004	99.95
	0.4731	0.0052	98.90
	0.6692	0.0043	99.36
PGME	0.7093	0.4278	39.69
	0.9681	0.4345	55.12
	0.7613	0.6586	13.49
Heptane	0.7196	0.0015	99.79
	0.6064	0.0030	99.51
	0.9869	0.0001	99.99

Summary:

Substrates:	Aluminum				
Contaminants:	Coatings				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
No Specific Vendor	Methyl Acetate-water	5	0.53	☐	
No Specific Vendor	t-Butyl Acetate-water	83.5	99.40	☑	
No Specific Vendor	Propylene Glycol Methl Ether-water	49	36.50	☐	
J.T. Baker	Heptane Low water	87.1	99.76	☑	

Conclusion: The heptane-water azeotrope removed 99.8% of the canola oil, the t-Bac-water removed 99.4%, PGME-water removed 36.1% and the MeOAc removed 0.53%.