CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2023

DateRun: 10/04/2023

Experimenters: Alexander Symko, Amelia Wagner

ClientType: University

ProjectNumber: Project #2

Substrates: Aluminum

PartType: Part

Contaminants: Greases, Waxes

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To assess the efficacy of several solvents in removing glyconol wax soil from aluminum coupons (although the wax soil is only used on the composite fiberglass coupons, aluminum coupons were used in order to save the amount of fiberglass materials needed as well as to see the cleaning efficacy of the chemistries on the wax soil itself. If these solvents are successful, compatibility testing with the fiberglass composite will be the next step).

Experimental Procedure: Six solvents were chosen using previous testing data on their performance for removing other waxes and greases. Three pre weighed aluminum coupons were assigned to each solvent for each substrate for a total of 18 aluminum coupons. The coupons were soiled with the glyconol wax soil (about 0.5 grams) by placing a small ball of wax onto the bottom third of the coupon, heating it with a heat gun to melt the wax, and then spreading the wax into a strip across the bottom third of the coupons. After soiling, the dirty weights of the coupons were recorded. The coupons were then subjected to 20 mins of unheated ultrasonics in their respective cleaners. The coupons were left to air dry overnight before the clean weights were recorded.

Results: A

Cleaner	Initial wt of cont.	Final wt of cont.	%Cont Removed	% AVG
1-Propanol	0.0888	0.0015	98.31	98.64
	0.0818	0.0004	99.51	
	0.0731	0.0014	98.08	
Thiophene	0.0590	0.0007	98.81	98.64
	0.0446	0.0012	97.31	
	0.0487	0.0001	99.79	
1-Butanol	0.0761	0.0015	98.03	99.34
	0.0530	0.0000	100.00	
	0.0429	0.0000	100.00	
Dowanol PnBGE	0.0531	0.0021	96.05	97.39
	0.0786	0.0020	97.46	
	0.0757	0.0010	98.68	
PC 118 EPS Stripper	0.0755	0.0616	18.41	25.38
	0.0824	0.0633	23.18	
	0.0628	0.0411	34.55	
Flexisolv DBE-LVP Esters	0.0703	0.0171	75.68	80.46
	0.0925	0.0069	92.54	
	0.0689	0.0185	73.15	

Although the Flexisolv DBE-LVP Esters removed a high percentage of the soil from the coupons, some of the wax visibly remained on the coupons after cleaner.

Summary:

Conclusion: 1-Propanol, Thiophene, 1-Butanol, and Dowanol PnBGE are all effective cleaners in removing the wax soil from aluminum coupons. PC 118 EPS Stripper is not an effective cleaner in removing the wax soil from aluminum coupons. Flexisolv DBE-LVP Esters is a somewhat effective cleaner in removing the wax soil from aluminum coupons.