CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2024

DateRun: 02/09/2024

Experimenters: Amelia Wagner

ClientType: Coatings Manufacturer

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Adhesive

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: Evaluating the effectiveness of alternative cleaners identified from prior Hansen Solubility Parameters Test

Experimental Procedure: Stainless Steel Coupons were weighed prior to soiling with supplied adhesives, Adhesive 5017 and Adhesive 5024. The coupons were weighed again after soiling before being immersed in the chemicals being tested, that being Anisole, Methyl Acetate, Ethyl Acetate, and Diethyl Carbonate. For the Adhesive 5017, the coupons were immersed in the unheated solvent for 25 minutes and then checked to see if a manual wipe step was necessary to remove the remaining adhesive. The coupons were then allowed to dry overnight before final weights were taken. The procedure for Adhesive 5024 was almost identical, except that the immersion time was 45 minutes instead of 25 minutes, followed by a check for a manual wipe step, drying overnight, and final weighing.

Results:

Cleaner	Contaminant	Initial Contaminant Weight (g)	Final Contaminant Weight (g)	% of contaminant removed	Overall % Removal	Manual Wipe Step?
Anisole	5017	0.1998	0.0127	93.64	93.99	Yes
		0.3363	0.0178	94.71		
		0.2223	0.0142	93.61		
	5024	0.3312	0.0070	97.89	97.32	Yes
		0.2549	0.0070	97.25		
		0.2075	0.0066	96.82		
Methyl Acetate	5017	0.2242	0.0020	99.11	97.97	No
		0.2800	0.0121	95.68		
		0.2642	0.0023	99.13		
	5024	0.2709	0.0095	96.49	95.87	Yes
		0.2300	0.0128	94.43		
		0.1483	0.0049	96.70		
Ethyl Acetate	5017	0.2039	0.0038	98.14	98.74	No
		0.2274	0.0010	99.56		
		0.1081	0.0016	98.52		
	5024	0.1594	0.0005	99.69	97.74	Yes
		0.4201	0.0254	93.95		
		0.2318	0.0010	99.57		
Diethyl Carbonate	5017	0.5141	0.0026	99.49	99.81	Yes
		0.1976	0.0001	99.95		
		0.2453	0.0000	100.00		
	5024	0.2127	0.0032	98.50	96.62	No
		0.1056	0.0014	98.67		No
		0.2491	0.0182	92.69		Yes

Summary:

Conclusion: The results of this experiment are promising, and show that the HSPiP Analysis conducted in the prior experimental trial was accurate to the adhesives being examined. While unfortunately no solvent was able to completely remove the need for a manual wipe step, both methyl and ethyl acetate eliminated the need for a manual wipe step for Adhesive 5017. Unfortunately, only Diethyl Carbonate was somewhat successful in removing the manual wipe step for Adhesive 5024, with 2 of the three coupons not requiring it. Manual wipe notwithstanding, all the solvents selected were very effective at removing the adhesive soils, with every trial achieving over 90% adhesive removal. Ethyl Acetate and Diethyl

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Carbonate had the highest average percent removal for adhesive 5017, at 98.74% and 99.81% respectively, while Ethyl acetate and Anisole had the highest average percent removal for Adhesive 5024, at 97.74% and 97.32% respectively.