CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2023

DateRun: 12/01/2023

Experimenters: Tatyanna Moreland Junior

ClientType: Lab

ProjectNumber: Project #8

Substrates: Aluminum, Stainless Steel, Steel

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate the effectiveness of SB-27 (t-Butyl Acetate 70% (CAS No: 540-88-5) + Benzyl Alcohol 30% (CAS No: 100-51-6)) and SB-31 (Benzyl Alcohol 63% (CAS No: 100-51-6) + Ethyl Lactate 37% (CAS No: 97-64-3)) in removing Oak 529 oil from stainless steel, aluminum, and steel coupons as a potential replacement for TCE with an unheated ultrasonic cleaning method.

Experimental Procedure: Nine brass coupons were used for each cleaner being tested, for a total of 18 coupons. The initial weights of each coupon were recorded. The bottom third of every coupon was soiled by applying the soil with a swab. The dirty weights of each coupon were then recorded. The coupons were then subjected to unheated ultrasonic in SB-27 and SB-31 for 15 minutes. After the coupons were cleaned, they were left to air dry overnight. The next morning, the clean weights of each coupon were taken.

Results:

Cleaner	Substrate	Initial content weight	Final content weight	Percent content removed	Average percent removed
SB-27	Stainless Steel	0.0262	-0.0067	125.57	106.35
			-0.0019	113.87	
		0.0265	0.0054	79.62	
	Aluminum	0.0346	0.0004	98.84	93.76
		0.0232	-0.0074	131.90	
		0.019	0.0094	50.53	
	Steel	0.0106	0.0016	84.91	81.07
		0.0134	0.0054	59.70	
		0.0071	0.0001	98.59	
SB-31	Stainless Steel	0.0176	-0.0009	105.11	89.50
		0.0226	0.0006	97.35	
		0.0212	0.0072	66.04	
	Aluminum	0.0670	0.0451	32.69	-9.28
		0.0389	0.0063	83.80	
		0.0088	0.0215	-144.32	
	Steel	0.0248	0.0368	-48.39	-41.08
		0.0418	0.0289	30.86	
		0.0298	0.0613	-105.70	

Summary:

Substrates:	Aluminum, Stainless Steel, Steel				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
TURI Cleaning lab	SB-27	100	94.00	☑	
TURI Cleaning lab	SB-31	100	13.00	☐	

Conclusion: There was a large amount of variation in how the cleaners and substrates interacted. SB-27 seemed to clean really well, while the coupons cleaned with SB-31 never dried overnight. Further testing would be needed to examine if these cleaners can be a suitable replacement for TCE.