CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2024

DateRun: 02/26/2024

Experimenters: Tatyanna Moreland Junior

ClientType: Lab

ProjectNumber: Project #8

Substrates: Brass, Copper

PartType: Coupon

Contaminants: Lubricating/Lapping Oils

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate the effectiveness of SB-2, SB-11, SB-22, SB-23, and SB-32 in removing LMKT Lapping Compound from copper and brass coupons as a potential replacement for TCE with an unheated ultrasonic cleaning method.

Experimental Procedure: Three copper and brass coupons were used for each cleaner being tested, for a total of 15 coupons per cleaner. The initial weights of each coupon were recorded. The bottom third of every coupon was soiled by applying the contaminate with a swab. The dirty weights of each coupon were then recorded. The coupons were then subjected to unheated ultrasonic in the cleaners 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:

Substrate	Cleaner	Coupon #	Initial Content Weight	Final Content Weight	Percent Content Removed	Average Percent Removed
Copper	SB-2	2	0.0615	0.0981	-59.51	-101.13
		12	0.0429	0.0935	-117.95	
		15	0.0351	0.0793	-125.93	
	SB-11	7	0.0293	0.0327	-11.60	-20.67
		17	0.0301	0.0429	-42.52	
		21	0.0266	0.0287	-7.89	
	SB-22	11	0.0497	0.0012	97.59	102.46
		23	0.047	0.0006	98.72	
		27	0.0217	-0.0024	111.06	
	SB-23	1	0.0369	-0.0006	101.62	98.63
		14	0.0326	0.0009	97.24	
		31	0.0303	0.0009	97.03	
	SB-32	3	0.0617	-0.0009	101.46	103.42
		6	0.0339	-0.0021	106.19	
		16	0.0424	-0.0011	102.59	
Brass	SB-2	9	0.0181	0.0161	11.05	24.35
		11	0.0494	0.0251	49.19	
		25	0.0234	0.0204	12.82	
	SB-11	12	0.0202	0.0325	-60.89	-3.04
		14	0.0378	0.0277	26.72	
		23	0.0379	0.0284	25.07	
	SB-22	4	0.0454	-0.0027	105.95	109.58
		15	0.0281	-0.004	114.23	
		17	0.028	-0.0024	108.57	
	SB-23	2	0.0245	-0.0027	111.02	106.20
		8	0.0201	-0.0026	112.94	
		10	0.0636	0.0034	94.65	
	SB-32	16	0.0502	-0.0054	110.76	99.67
		18	0.0503	0.0078	84.49	
		34	0.0585	-0.0022	103.76	

Summary:

CLEANING LABORATORY EVALUATION SUMMARY

Substrates:	Brass, Copper				
Contaminants:	Lubricating/Lapping Oils				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
TURI Cleaning lab	SB-2	100	38.00	☐	
TURI Cleaning lab	SB-11	100	-12.00	☐	
TURI Cleaning lab	SB-22	100	106.00	☐	
TURI Cleaning lab	SB-23	100	102.00	☑	
TURI Cleaning lab	SB-32	100	101.00	☑	

Conclusion: SB-2 and SB-11 did not dry properly overnight, making their final contents higher than their initials. SB-22 and SB-23 seemed like effective alternatives, but due to the "overcleaning" causing negative percent removals, further testing could be done to create the ideal range of cleaning time and contaminants added. SB-32 turned light blue after testing, this was caused by the Ethyl Lactate stripping copper ions from the metal and the mixture will not be used in further testing.