CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2023

DateRun: 04/13/2023

Experimenters: Amelia Wagner

ClientType: Lab

ProjectNumber: Project #8

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Greases, Lubricating/Lapping Oils

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate the effectiveness of SB-16 (a FAME + Methyl Lactate mixture) in removing several production oils and greases from stainless steel coupons as a potential replacement for TCE using heated ultrasonics cleaning method.

Experimental Procedure: Three stainless steel coupons were used for each of the five soils being tested for a total of 15 coupons. The initial weights of each coupon were recorded. The bottom third of every coupon was soiled by applying the corresponding soil with a swab. The dirty weights of each coupon were then recorded. The coupons were then subjected to heated ultrasonics cleaning in a solution of Fatty Acid Methyl Ester 93% + Ethyl Lactate 7% for 15 minutes at 130 F. After the coupons were cleaned, they dried with a heat gun for about 2 minutes each. The next morning, the clean weights of each coupon were taken

Soil	Use	CAS
Milform OAK 7a International	Stamping and drawing fluid	64742-53-6 / 68909-65-9
Milform Oak 529	Evaporative lubricant	68551-17-7 / 123-95-5 / 127087-87-0
Milform Oak 15a	Metalworking oil	64742-44-5 / 64742-52-5 / 64742-55-8
Milform Oak 15c	Metalworking oil	64742-52-5 / 64742-53-6
M4		

Results:

Solvent	Substrate	Soil	Initial wt of cont.	Final wt of cont.	%Cont Removed	% AVG	% Overall
Fatty Acid methyl ester 93% + Ethyl lactate 7%	Stainless Steel	Oak 7a international	0.0753	0.0308	59.10	67.74	72.69
		Oak 7a international	0.0635	0.0202	68.19		
		Oak 7a international	0.0781	0.0188	75.93		
		M4	0.1500	0.0254	83.07	82.94	
		M4	0.2122	0.0416	80.40		
		M4	0.1380	0.0202	85.36		
		Oak 15C	0.0709	0.0118	83.35	80.84	
		Oak 15C	0.0775	0.0154	80.13		
		Oak 15C	0.1068	0.0224	79.03		
		Oak 15A	0.1911	0.0158	91.73	87.13	
		Oak 15A	0.1891	0.0244	87.10		
		Oak 15A	0.1571	0.0274	82.56		
		Oak 529	0.0273	0.0152	44.32	44.80	
		Oak 529	0.0309	0.0231	25.24		
		Oak 529	0.0330	0.0116	64.85		

When the coupons were dried with a heat gun for 2 minutes each, a white vapor was emitted in the fume hood.

Summary:

Substrates:	Stainless Steel

CLEANING LABORATORY EVALUATION SUMMARY

Contaminants:	Greases, Lubricating/Lapping Oils				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
TURI Cleaning lab	SB-16		68.00	☐	on soil Oak 7A
TURI Cleaning lab	SB-16		83.00	☑	on soil M4
TURI Cleaning lab	SB-16		80.00	☑	on soil Oak 15 C
TURI Cleaning lab	SB-16		87.00	☑	on soil Oak 15 A
TURI Cleaning lab	SB-16		45.00	☐	on soil Oak 529

Conclusion: SB-16 (Fatty Acid Methyl Ester 93% + Ethyl Lactate 7%) is an effective cleaner for soils M4, Oak 15C, and Oak 15a if a drying step is feasible. It is not an effective cleaner for soils Oak 7a international and Oak 529.