CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2023

DateRun: 04/05/2023

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 a FAME + Methyl Lactate mixture (SB-16) in removing several production oils and greases from stainless steel coupons as a potential replacement for TCE using unheated 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 unheated ultrasonics cleaning in a solution of Fatty Acid Methyl Ester 93% + Ethyl Lactate 7% for 15 minutes. After the coupons were cleaned, they were 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	0.0441	0.0155	64.85	78.75	92.7
		Oak 7a international	0.0542	0.0077	85.79		
		Oak 7a international	0.0465	0.0067	85.59		
		M4	0.4811	0.0066	98.63	98.25	
		M4	0.4672	0.0131	97.20		
		M4	0.6279	0.0068	98.92		
		Oak 15C	0.0721	0.0094	86.96	93.68	
		Oak 15C	0.0696	0.0019	97.27		
		Oak 15C	0.1287	0.0041	96.81		
		Oak 15A	0.2584	0.0069	97.33	97.72	
		Oak 15A	0.2136	0.0047	97.80		
		Oak 15A	0.3051	0.0060	98.03		
		Oak 529	0.0307	0.0010	96.74	92.43	
		Oak 529	0.0305	0.0024	92.13		
		Oak 529	0.0449	0.0052	88.42		

While each coupon was dried with a heat gun for 2 minutes each, the solvent SB-16 emitted a white vapor in the fume hood.

Summary:

Substrates:	Stainless Steel

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Contaminants:	Greases, Lubricating/Lapping Oils				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
TURI Cleaning lab	SB-16		79.00	☑	on soil Oak 7a international
TURI Cleaning lab	SB-16		98.00	☑	on soil M4
TURI Cleaning lab	SB-16		94.00	☑	on soil Oak 15C
TURI Cleaning lab	SB-16		98.00	☑	on soil Oak 15A
TURI Cleaning lab	SB-16		92.00	☑	on soil Oak 529

Conclusion: SB-16 (Fatty Acid Methyl Ester 93% + Ethyl Lactate 7%) is a very effective cleaner for soils M4, Oak 15C, Oak 15A and Oak 529 if a drying step is feasible. It is an effective cleaner for soil Oak 7a international if a drying step is feasible.