CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 02/22/2021

Experimenters: Zoe Lawson, Justin Kiander

ClientType: Precision Instrument Manufacturer

ProjectNumber: Project #1

Substrates: Steel

PartType: Part

Contaminants: Greases

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric, Visual

Purpose: The purpose of this experiment was to determine the effectiveness of cleaners in removing company soil from steel parts.

Experimental Procedure: Cleaners were prepared to the following concentrations: Metalnox 6386 100%, Water Works Heavy Duty Degreaser 7:1, SC Aircraft & Metal Cleaner 20%. Cleaners and an ultrasonic bath were heated to 100°F. Three steel sheet parts were obtained and weighed. Parts were then soiled with aviation grease and a dirty weight was recorded. Once solutions reached the proper temperature, parts were added to their respective cleaner and ultrasonic cleaning was conducted for 15 minutes. After 15 minutes, parts cleaned with SC Aircraft were rinsed in a deionized water bath at 100°F for 30 seconds. All parts were then dried with a heat gun at ambient setting. Following the drying step coupons were weighed and a clean weight was recorded. Effectiveness of the cleaners was determined.

Results:

Cleaner	Initial wt of cont	Final wt of cont	%Cont Removed	%AVG
Metalnox 6386	0.4255	0.0345	91.89	93.79%
	0.2903	0.015	94.83	
	0.3211	0.0172	94.64	
Water Works	0.2523	0.0393	84.42	93.6%
	0.337	0.0032	99.05	
	0.2361	0.0063	97.33	
SC Aircraft & Metal	0.2062	0.0116	94.37	67.28%
	0.21	0.0732	65.14	
	0.3265	0.1883	42.33	

Metalnox 6386 was the most effective cleaner removing an average of 93.79% of soil. Water Works was the second most effective removing an average of 93.6%. There were no observed rusting spots on Water Works parts, as solutions was immediately dried under ambient temperatures after cleaning. A line of aviation grease remained where the solution met the top portion of the cleaned area for Water Works. Only small spots of grease remained on parts cleaned by Metalnox. Parts cleaned with SC Aircraft still had sizeable chucks or streaks or grease after the cleaning process. Compared to Metalnox and Water Works, SC Aircraft does not achieve the same level of consistent performance on parts and will be dropped from future testing. Next steps would be to clean steel parts with the penetrant spray soil.

Summary:

Substrates:	Steel				
Contaminants:	Greases				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Kyzen Corporation	Metalnox M6386	100%	93.79	☑	
Keteca USA	Water Works Heavy Duty Degreaser	7:1	93.60	☑	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	20%	67.28	☐	

Conclusion: Upon completion of testing, it was determined that Metalnox 6386 and Water Works Heavy Duty were the most effective cleaners in removing the aviation grease. Although SC Aircraft can perform well under this method, it does not demonstrate the same level of consistent performance compared to the other cleaners and will be dropped from further testing. Next steps will be to continue parts testing on steel substrates with the penetrant spray.