CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 01/19/2021

Experimenters: Justin Kiander

ClientType: Precision Instrument Manufacturer

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric, Visual

Purpose: The purpose of this experiment was to determine the effectiveness of cleaners after reducing total time to clean from 10 minutes to 5 minutes.

Experimental Procedure: Cleaners were prepared to the following concentrations: Metalnox 6386 100%, Dimethyl Glutarate 100%, Water Works Heavy Duty Degreaser 7:1, SC Aircraft & Metal Cleaner 20%, Crystal Simple Green Industrial 30 parts water. SC Aircraft was heated to 100°F while remaining cleaners were kept at room temperature. Three aluminum coupons were obtained and weighed for each of the cleaners being tested. Coupons were then soiled with V-4B oil and a dirty weight was recorded. Once solutions reached the proper temperature, coupons were submerged into their respective cleaners for 5 minutes. After 5 minutes, coupons cleaned with SC Aircraft were rinsed in a deionized water bath at 100°F for 30 seconds. All coupons were then dried with a heat gun to remove excess solution and allowed to finish drying in air for 24 hours. Following the drying step, coupons were once again 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	0.0385	-0.0001	100.26	100.41%
	0.0233	0	100	
	0.0205	-0.0002	100.98	
Dimethyl Glutarate	0.0134	-0.0003	102.24	101.54%
	0.013	-0.0002	101.54	
	0.0119	-0.0001	100.84	
Water Works Heavy Duty	0.0128	0	100	99.18%
	0.0081	0.0002	97.53	
	0.0074	0	100	
SC Aircraft & Metal	0.0082	-0.0004	104.88	105.84%
	0.0101	-0.0005	104.95	
	0.0065	-0.0005	107.69	
Crystal Simple Green	0.0081	-0.0001	101.23	102.73%
	0.006	-0.0002	103.33	
	0.0055	-0.0002	103.64	

All cleaners were effective at removing the soil from aluminum substrates. Decreasing the total time to clean to 5 minutes was effective in further reducing the increased percent removals to near 100%. There has consistently been no visual damage to any of the coupons cleaned with these solutions.

Summary:

Substrates:	Aluminum				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Kyzen Corporation	Metalnox M6386	100%	100.41	☑	
Fisher Scientific	Dimethyl glutarate (CAS:1119-40-0)	100%	101.54	☑	
Keteca USA	Water Works Heavy Duty Degreaser	7:1	99.18	☑	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	20%	105.84	☑	
Simple Green			102.73	☑	

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	Crystal Simple Green Industrial Cleaner & Degreaser	30 parts water			

Conclusion: Upon completion of testing, it was determined that 5 minutes is the optimal time to remove the oil from aluminum substrates. All cleaners were able to remove soil within acceptable percent removals. Next steps would be to progress testing to the next soil detailed by the company starting at 5 minutes of immersion.