CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 02/08/2021

Experimenters: Zoe Lawson, Justin Kiander

ClientType: Precision Instrument Manufacturer

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric, Visual

Purpose: The purpose of this experiment was to determine the effectiveness of top cleaners and method on removing the vanishing oil.

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 aluminum coupons were obtained and weighed for each of the cleaners being tested. Coupons were then soiled with the V-4B oil and a dirty weight was recorded. Once solutions reached the proper temperature, coupons were submerged into their respective cleaners and ultrasonic cleaning was conducted for 15 minutes. After the 15 minutes, coupons cleaned with SC Aircraft were rinsed in a deionized water bath at 100°F for 30 seconds. All coupons were then partially dried with a heat gun to remove excess solution and finished drying in air for 24 hours. Following the drying step, coupons were weighed again 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	0.0513	0.0003	99.42	99.44%
	0.0348	0.0003	99.14	
	0.0416	0.0001	99.76	
Water Works	0.0388	0.0023	94.07	90.88%
	0.0371	0.0035	90.57	
	0.0275	0.0033	88.00	
SC Aircraft & Metal	0.0403	0.0005	98.76	97.27%
	0.0271	0.0014	94.83	
	0.0452	0.0008	98.23	

All cleaners were effective at removing the vanishing oil from aluminum substrates via the heated ultrasonic method. There was no visible residue or markings of potential damage on any of the cleaned coupons. Next steps would be to test the cleaners and method on copper substrates.

Summary:

Substrates:	Aluminum				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Kyzen Corporation	Metalnox M6386	100%	99.44	☑	
Keteca USA	Water Works Heavy Duty Degreaser	7:1	90.88	☑	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	20%	97.27	☑	

Conclusion: Upon completion of testing it was determined that all cleaners were effective at removing the vanishing oil via heated ultrasonics. Next steps would be to conduct testing on copper substrates with the aviation grease.