CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 02/09/2021

Experimenters: Zoe Lawson, Justin Kiander

ClientType: Chemical Company

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Cutting/Tapping Fluids

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric, Visual

Purpose: The purpose of this experiment was to determine the effectiveness of alternative cleaners on company provided soils.

Experimental Procedure: Cleaners were prepared to the following concentrations: Metalnox 6386 100%, Dimethyl Glutarate 100%, Water Works Heavy Duty Degreaser 7:1, Mirachem 500 20%, Citranox 2%. Three aluminum coupons were obtained and weighed for each of the cleaners being tested. Coupons were then soiled with a cutting oil provided by the company and a dirty weight was recorded. Coupons were then submerged into their respective cleaners for 15 minutes at room temperature. After 15 minutes had passed, coupons were dried with an air gun at ambient temperature to removed excess solution and allowed to finish drying 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	0.0058	-0.0001	101.72	105.02%
	0.0090	-0.0002	102.22	
	0.0009	-0.0001	111.11	
Dimethyl Glutarate	0.0137	0.0003	97.81	99.89%
	0.0108	-0.0002	101.85	
	0.0058	0.0000	100.00	
Water Works	0.0309	0.0001	99.68	100.06%
	0.0090	0.0001	98.89	
	0.0249	-0.0004	101.61	
Mirachem 500	0.0021	-0.0005	123.81	107.50%
	0.0232	0.0002	99.14	
	0.0228	0.0001	99.56	
Citranox	0.0017	0.0000	100.00	101.11%
	0.0278	0.0000	100.00	
	0.0120	-0.0004	103.33	

All cleaners were effective at removing the cutting oil from aluminum substrates via unheated immersion. It was observed that when applying the soil, the soil was either rapidly absorbed by or evaporated off of the coupon. This can account for the small weights of contaminate and high removal percentages as observed with Metalnox coupon #3 and Mirachem coupon #1. The company has been contacted to determine if this is expected or if more soil should be applied in a retest. Next steps would be to progress testing to the next company soil if a retest is not necessary.

Summary:

Substrates:	Aluminum				
Contaminants:	Cutting/Tapping Fluids				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Kyzen Corporation	Metalnox M6386	100%	105.02	☑	
Fisher Scientific	Dimethyl glutarate (CAS: 1119-40-0)	100%	99.89	☑	
Keteca USA	Water Works Heavy Duty Degreaser	7:1	100.06	☑	
Mirachem Corporation	Mirachem 500	20%	107.50	☑	
Alconox Inc	Citranox	2%	101.11		

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Conclusion: Upon completion of testing, it was determined that all cleaners were effective at removing the cutting oil from aluminum substrates. There was the potential that too little soil was used, and the company has been contacted to verify. Next steps would be to progress testing to the next soil if a retest is not necessary.