CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2020

DateRun: 11/15/2020

Experimenters: Justin Kiander

ClientType: Metal Working

ProjectNumber: Project #1

Substrates: Stainless Steel

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 in removing grind oil from stainless steel coupons via heated immersion at an increased temperature.

Experimental Procedure: Cleaners were prepared to the following concentrations: Dimethyl glutarate 100%, Smart Solve 605 100%, SC Aircraft & Metal Cleaner 20%, SC Supersolve 20%, Crystal Simple Green Industrial Cleaner 30 parts water. All cleaners, except for Crystal Simple Green, were heated to a temperature of 120°F. Crystal Simple Green was kept at 100°F as the cleaner cannot be used above 105°F. A stir bar was added to the Crystal Simple Green solution for agitation. Three stainless steel coupons were obtained and weighed for each of the cleaners being tested. Coupons were then soiled with grind oil provided by the company and a dirty weight was recorded. Once solutions reached the proper temperature, coupons were submerged into their respective cleaners for 15 minutes. After 15 minutes, coupons cleaned with SC Aircraft and Smart Solve 605 were submerged into a deionized water bath at 120°F for 30 seconds. All coupons were partially dried with a heat gun and allowed to finish drying in air. A clean weight was recorded and effectiveness of the cleaners was determined.

Results:

Cleaner	Initial wt of cont	Final wt of cont	%Cont Removed	%AVG
Dimethyl Glutarate	0.0325	0.0064	80.31	84.51%
	0.0224	0.0032	85.71	
	0.0168	0.0021	87.50	
Smart Solve 605	0.0162	0.0007	95.68	93.98%
	0.0132	0.0011	91.67	
	0.0166	0.0009	94.58	
SC Aircraft & Metal	0.0282	0.0060	78.72	71.32%
	0.0224	0.0054	75.89	
	0.0214	0.0087	59.35	
SC Supersolve	0.0473	0.0097	79.49	64.71%
	0.0214	0.0104	51.40	
	0.0155	0.0057	63.23	
Crystal Simple Green	0.0135	-0.0021	115.56	95.21%
	0.0192	0.0045	76.56	
	0.0154	0.0010	93.51	

Summary:

Substrates:	Stainless Steel				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Fisher Scientific	Dimethyl glutarate (CAS: 1119-40-0)	100%	84.51	☑	
United Laboratories International	Smart Solve 605	100%	93.98	☑	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	20%	71.32	☐	
Gemtek Products	SC Supersolve Safety Solvent	20%	64.71	☐	
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	30 parts water	95.21	☑	Stir bar for agitation was set to 380 rpm.

Conclusion:

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Crystal Simple Green was the most effective cleaner removing an average of 95.21% from stainless steel substrates. Smart Solve 605 was the second most effective with an average removal of 93.98%. Next steps would be to speak with laboratory specialist to determine if testing can progress to parts.