CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2017

DateRun: 05/21/2017

Experimenters: Carla De La Cruz

ClientType: Cleaner Manufacturer

ProjectNumber: Project #3

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To find the most effective cleaner between Chemetall's Citrosolv and MD Stetson PC 107 for cleaning maintenance and production soils from stainless steel

Experimental Procedure: The coupons were selected and arranged in sets of three for each cleaner and soil combination. The clean weights were first taken followed by soiling each set of coupons with the respective soil. The testing plan called for oven aging for thirty minutes. The maintenance soil was aged at 40°C and the production soil was aged at 105°C. After aging, the coupons were weighed once more to determine amount of soil applied. Visual observations were recorded while coupons were immersed in the respective cleaners for 20 minutes at room temperature (68^{0}F). After the 20 minutes, coupons were removed from the solutions and rinsed in a multistage set up of deionized water (DI) beakers. Coupons air dried for 30 minutes, and then all coupons were placed in the oven at 105°F for an additional 30 minutes. Final weights were taken after the coupons had dried.

Results: MD Stetson's PC 107 steadily removed the production soil. Within 10 minutes, most of the soil had been removed and only small droplets remained on the coupon. There was very little production soil remaining after rinsing, as the soil ran off the coupons immediately after rinsing both sets. The Citrosolv set of coupons showed similar observations to those made with PC 107. Unlike PC 107, which removed essentially all of the production soil, two of the Citrosolv coupons appeared almost completely clean, while a third showed significantly more residue.

An incident occurred between one maintenance soiled coupon and a production soiled coupon. The maintenance soil touched the coupon soiled with production soil. The coupon was almost completely cleaned but the incident caused the clean weight to increase as the cross contamination could not be removed with rinsing. The maintenance soil coupon showed a very high 93.5% removal—compared to the other two coupons in the set—due to the incident. The coupon soiled with production soil showed a lower value of 87.8%, compared to the other two coupons in the set.

When the maintenance soil was tested, the results were quite different. The solutions appeared hazy, but the soil did not look like it was visibly removed for 15 minutes. Once the coupons were removed and the solution was agitated, the soil came off in a powder-like form that turned each solution a dilute black. Rinsing did not aid in removing much of the soil and the DI water showed no signs of the soil.

Cleaner	Soil	Initial wt	Final wt	%Removed	%Avg Removed	Overeall Avg
PC 107	Maintenance soil	0.0946	0.0311	67.12	72.85	84.14
		0.0957	0.0403	57.89		
		0.0989	0.0064	93.53		
	Production soil	0.0986	0.0009	99.09	95.43	
		0.0976	0.0119	87.81		
		0.0969	0.0006	99.38		
Citrosolv	Maintenance soil					
		0.1026	0.0645	37.13	32.74	64.03
		0.098	0.0559	42.96		
		0.1009	0.0826	18.14		
	Production soil					
		0.096	0.001	98.96	95.32	
		0.0967	0.0103	89.35		
		0.0975	0.0023	97.64		

Summary:

CLEANING LABORATORY EVALUATION SUMMARY

Substrates:	Stainless Steel				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Next-Gen Supply Group	PC 107 Heavy duty APC & Degreaser	0.4	84.14	☑	
Fisher Scientific	Absolute Ethanol	0	0.00	☐	
Next-Gen Supply Group	Citrosolve	2.3	64.03	☐	

Conclusion: MD Stetson's PC 107 was as effective as Citrosolv at removing the Production soil. Although it did not remove the Maintenance soil as easily as the Productions soil, PC 107 was the most effective cleaner.