CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2010
DateRun:	08/05/2010
Experimenters:	Jason Marshall, Timothy Weil
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Stainless Steel
PartType:	Coupon
Contaminants:	Oil
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	Perform an evaluation of the supplied products following basic laboratory testing methodology to screen for effective cleaning formulations.
Experimental Procedure:	The maintenance soil, consisting of 10 grams of carbon black, 10 grams iron oxide, 100 ml WD-40, 100 ml hydraulic oil, and 100 ml gear oil was placed in a 750 beaker and mixed for 20 minutes at room temperature using a magnetic stirrer. The resulting soil was applied to preweighed stainless steel coupons using a handheld swab. The soil was allowed to air dry for 24 hours. Coupons were weighed to determine the amount of soil applied. Three coupons were immersed in glass beakers containing 400 ml of the supplied solutions at full strength. Cleaning lasted for 5 minutes using stir-bar agitation for 15 seconds at room temperature and air dried for one hour. Once dry, final weights were recorded, and efficiencies calculated for each coupon cleaned. Observations during and after cleaning were made for each of the five solutions.
Results:	Three of the five formulations removed over 85% of the oil mixture from the stainless-steel coupons using immersion cleaning. After immersion cleaning, some of the oil was loosely attached to the coupon surface and was removed using the tap water spray rinse. In addition to the residue observation, a couple of the solutions were noted to have good separation of the oil from the cleaning solution after the stir bar agitation was removed. This would allow for easy bath life upkeep, prolonging how long the cleaner could be effectively used for a cleaning system.

Cleaner	Initial wt	Final wt	% Removed	Observations
LiQuiFix Inc LF001-001				Some residue, no separation of oil
	0.0383	0.0096	74.93	
	0.0455	0.0155	65.93	
	0.0383	0.0076	80.16	
LiQuiFix Inc LF001-002				Little residue, separation of oil
	0.0398	0.003	92.46	
	0.0241	0.0015	93.78	
	0.0396	0.0024	93.94	
LiQuiFix Inc LF001-003				Some residual film, separation of oil
	0.0233	0.0052	77.68	
	0.0304	0.0008	97.37	
	0.0392	0.0059	84.95	
LiQuiFix Inc LF001-004				Residual film, no separation of oil
	0.0369	0.0115	68.83	
	0.0354	0.0028	92.09	
	0.0188	0.0023	87.77	

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LiQuiFix Inc LF001-005				Some residual film, no separation of oil
	0.0296	-0.0001	100.34	
	0.0668	0.0094	85.93	
	0.0799	0.0037	95.37	

Summary:

Substrates:	Stainless Steel				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Liquifix	Sample # LF-001-001	100	73.67	☐	
Liquifix	Sample # LF-001-002	100	93.39	☑	
Liquifix	Sample # LF-001-003	100	86.67	☑	
Liquifix	Sample # LF-001-004	100	82.90	☐	
Liquifix	Sample # LF-001-005	100	93.88	☑	

Conclusion:

The second product formulation good cleaning abilities and was able to separate the oil from the cleaning solution. The fifth formulation had good removal (>90%) but no separation.