CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2020
DateRun:	08/31/2020
Experimenters:	Justin Kiander
ClientType:	Metal Finishing
ProjectNumber:	Project #1
Substrates:	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 4 selected cleaners in removing Vanishing Oil from TURI zinc plated steel coupons using heated immersion.
Experimental Procedure:	Four cleaners were prepared to the following concentrations: Liquinox 1% conc., Surface Cleanse 930 5% conc., Sta Sol ESS 160 100% conc., Smart Solve 605 100% conc. Solutions were placed onto hot plates and heated to 100°F. Three zinc plated steel coupons were obtained for each of the four cleaners. An initial weight was taken, then coupons were soiled with Vanishing Oil provided by the company and a soiled weight was recorded. Once solutions reached the proper temperature, coupons were submerged into their respective cleaners for 15 minutes. After 15 minutes had passed, coupons were removed from the solutions and dried with an air gun on the cool setting. Once coupons were dried, a clean weight was determined. A wipe step was conducted after clean weights were obtained and another weight measurement was taken to determine if wiping helped in the removal process. Effectiveness of the cleaners was then determined.
Results:	Pre-wipe:

Cleaner	Initial wt. of cont.	Final wt. of cont.	% Cont. Removed	%AVG
Liquinox	0.0121	0.0033	72.73	107.72
	0.0158	-0.0009	105.7	
	0.0076	-0.0034	144.74	
Surface Cleanse 930	0.0585	0.0032	94.53	76.69
	0.0164	0.011	32.93	
	0.023	-0.0006	102.61	
Sta Sol ESS 160	0.0299	0.0045	84.95	75.16
	0.02	0.0156	22	
	0.0135	-0.0025	118.52	
Smart Solve 605	0.029	0.0063	78.28	64.72
	0.0126	0.0084	33.33	
	0.0149	0.0026	82.55	

Post-wipe:

Cleaner	Initial wt. of cont.	Final wt. of cont.	%Cont. Removed	%AVG
Liquinox	0.0121	0.0024	80.17	110.62
	0.0158	-0.0011	106.96	
	0.0076	-0.0034	144.74	
Surface Cleanse 930	0.0585	0.0038	93.50	91.64
	0.0164	0.0059	64.02	
	0.0230	-0.0040	117.39	
Sta Sol ESS 160	0.0299	0.0036	87.96	95.73
	0.0200	0.0046	77.00	
	0.0135	-0.0030	122.22	
Smart Solve 605	0.0290	0.0026	91.03	92.36
	0.0126	0.0048	61.90	
	0.0149	-0.0036	124.16	

Summary:

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Substrates:	Steel
Contaminants:	Oil

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Alconox Inc	Liquinox	1%	110.62	☑	Minimal improvement with a wipe.
International Products Corporation	Surface Cleanse Concentrated Neutral 930	5%	91.64	☑	Significant improvement with wipe.
JR Hess & Co., Inc.	Sta-Sol ESS 160	100%	95.73	☑	Significant improvement with wipe.
United Laboratories International	Smart Solve 605	100%	92.36	☑	Significant improvement with wipe.

Conclusion: The wipe step aided in the removal of the Vanishing Oil. After the wipe step, all cleaners were effective in removing the soil. Liquinox removed an average of 110.62% soil, Surface Cleanse 930 removed an average of 91.64%, Sta Sol ESS 160 removed an average of 95.73%, and Smart Solve 605 removed an average of 92.36%. The next step would be to incorporate a rinse step into the experiment to replace the wipe.