CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2016
DateRun:	04/14/2016
Experimenters:	Carla De La Cruz, Sabrina Apel
ClientType:	Machine Construction Company
ProjectNumber:	Project #2
Substrates:	Aluminum, Stainless Steel, Steel
PartType:	Coupon
Contaminants:	Resins/Rosins
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gravimetric
Purpose:	To Find a better cleaner for the machine screws.
Experimental Procedure:	Coupons of aluminum, stainless steel and steel were selected and arranged in rows on a tray. The initial weights were taken and recorded. The coupons were soiled with the Reipo resin and weighed. A manual wiping machine is used to clean coupons for 20 cycles /30 seconds was completed for each set of coupons. Final weights of the coupons were recorded.
Results:	All coupons had residue left behind due to the brush movement of the abrasion machine. The Solstice PF-2A, which did the worst, had an average performance of 97.83% removal. For the products, the amount of cleaner applied to the coupons and wipe could not be controlled, due to the low boiling point of the products they were escaping the spray bottles by themselves. Also, due to the low boiling points the coupons treated with Solstice products had to be cleaned promptly after applying the cleaner. There was a very, very small margin between the top two cleaners, FluoSolv NC and Solstice PF. They were 99.05% and 99.03% effective, respectively. All cleaners had above 97% efficiencies.

Cleaner	Substrate	Initial wt	Final wt	%Cont Removed
Sion	Aluminum	0.2099	0.0105	95.00
		0.3983	0.0036	99.10
		0.2957	0.0019	99.36
	Stainless Steel	0.4842	0.0021	99.57
		0.2881	0.0080	97.22
		0.2881	0.0038	98.68
	Steel	0.3690	0.0168	95.45
		0.3378	0.0057	98.31
		0.3433	0.0020	99.42
Fluosolv CX	Aluminum	0.3822	0.0037	99.03
		0.4126	0.0042	98.98
		0.3900	0.0119	96.95
	Stainless Steel	0.3412	0.0124	96.37
		0.4203	0.0044	98.95
		0.3595	0.0048	98.66
	Steel	1.3139	0.0189	98.56
		0.3734	0.0074	98.02
		0.2864	0.0109	96.19
Fluosolv NC	Aluminum	0.2145	0.0020	99.07
		0.2204	0.0009	99.59
		0.2398	0.0033	98.62

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	Stainless Steel	0.4112	0.0047	98.86
		0.2174	0.0016	99.26
		0.1698	0.0009	99.47
	Steel	0.2342	0.0037	98.42
		0.3141	0.0002	99.94
		0.3960	0.0069	98.26
Solstice PF	Aluminum	0.3750	0.0037	99.01
		0.3064	0.0012	99.61
		0.3560	0.0038	98.93
	Stainless Steel	0.4975	0.0049	99.02
		0.3334	0.0022	99.34
		0.3343	0.0012	99.64
	Steel	0.3825	0.0058	98.48
		0.3545	0.0026	99.27
		0.2917	0.0059	97.98
Solstice PF-2A	Aluminum	0.3114	0.0069	97.79
		0.2874	0.0074	97.43
		0.3086	0.0043	98.61
	Stainless Steel	0.2469	0.0085	96.56
		0.2869	0.0030	98.95
		0.2441	0.0023	99.06
	Steel	0.2670	0.0144	94.61
		0.2315	0.0002	99.91
		0.2719	0.0067	97.54

Summary:

Substrates:	Aluminum, Stainless Steel, Steel
Contaminants:	Resins/Rosins

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
DuPont	Vertrel Sion	100	98.01	☑	
NuGeneration Technologies, LLC	FluoSolv CX	100	97.97	☑	
NuGeneration Technologies, LLC	FluoSolv NC 786	100	99.05	☑	
Honeywell	Solstice PF with N2	100	93.03	☑	
Honeywell	Solstice PF-2A with N2	100	97.83	☑	

Conclusion:

All cleaners had above 97% efficiencies. Even the lowest average percent removal by Solstice PF-2A was found to be 97.83%. The best two products were FluoSolv NC and Solstice PF which had 99.05% and 99.03% removal. The Reipo was very easily removed, but due to the brush used with the abrasion machine there were streaks left behind on most coupons. Also, there was no way of controlling how much Honeywell product was applied to the wipe and coupons as the Honeywell chemistries have very low boiling point and began to uncontrollably escape the spray bottles during applications.