CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2010
DateRun:	08/04/2010
Experimenters:	Jason Marshall, Timothy Weil
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Stainless Steel
PartType:	Coupon
Contaminants:	Hucker's Soil
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gravimetric, Visual
Purpose:	To retest supplied solvents for all purpose testing using manual wiping.

Experimental Procedure:

The two supplied solvent were used at full strength and at a 50:50 mix with each other. Solvents were compared with Dowanol DPM - dipropylene glycol methyl ether.

Preweighed stainless steel coupons were coated with Hucker's Soil Formulation (Jiffy Creamy Peanut Butter 9.2%, Salted Butter 9.2%, Arrowhead Mills stone ground wheat flour 9.2%, Egg Yolk 9.2%, Evaporated milk 13.8%, Distilled water 45.8%, Printer's ink with boiled linseed oil 0.9%, Shaws saline solution 2.7%) using a handheld swab and allowed to dry for 24 hours at room temperature. The contaminated coupons were weighed again to determine the amount of soil added.

Three coupons were placed into a Gardner Straight Line Washability unit. A Kimberly-Clark Wypal reinforced paper towel was attached to the cleaning sled and soaked with 5-7 sprays of cleaning solutions. Each coupon was sprayed 7-10 times with the same cleaning solution. The cleaning unit was run for 20 cycles (~33 seconds).

At the end of the cleaning, coupons were observed visual to determine soil removal and/or residue levels. Coupons were then weighed to calculate soil removal amounts. Following this first final weight, coupons were wiped once with a dry paper towel and then weighed on last time to assess the amount of residue and overall efficiencies. A second soil consisting of DCC 17 soil (Mix lard, vegetable oil, vegetable shortening and carbon black) was applied to the same coupon types and cleaned in the same manner as the Hucker's soil.

Results:

Each of the solvents tested left some residue behind following cleaning. The DPM had the least residue remaining. The 50:50 mix had the most residue. The SG 21000D had slightly less than the SG 22002D. Visually, all four cleaners had removed all of the soil during the manual cleaning. The low efficiency results obtained in previous trials was due to the residue left after cleaning.

Cleaner	Initial wt	Final wt	% Removed	Visual Rank
SG21000D				
	0.0239	0.0570	-138.49	2
	0.0227	0.0546	-140.53	
	0.0313	0.0589	-88.18	
SG2200SD				
	0.0363	0.0590	-62.53	3
	0.0374	0.0819	-119.11	
	0.0303	0.0746	-146.20	
50:50 mix				
	0.0247	0.0817	-230.77	4
	0.0392	0.0802	-104.59	
	0.0354	0.0724	-104.52	
DPM				
	0.0363	0.0144	60.33	1
	0.0359	0.0282	21.45	
	0.0381	0.0249	34.65	

With Wipe

Cleaner	Initial wt	Final wt	% Removed
SG21000D	Wipe		
	0.0239	0.0020	91.63
	0.0227	0.0027	88.11

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	0.0313	0.0015	95.21
SG2200SD	Wipe		
	0.0363	0.0017	95.32
	0.0374	0.0041	89.13
	0.0303	0.0027	91.09
50:50 mix	Wipe		
	0.0247	0.0055	77.73
	0.0392	0.0035	91.07
	0.0354	0.0072	79.66
DPM	Wipe		
	0.0363	0.0020	94.49
	0.0359	0.0017	95.26
	0.0381	0.0019	95.01

Summary:

Substrates:	Stainless Steel
Contaminants:	Hucker's Soil

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Segetis	Segetis SG21000D	100	91.65	☑	
Segetis	Segetis SG22002D	100	91.85	☑	
Segetis	Segetis SG21000D	50	82.82	☐	50:50 mix with SG22002D
Dow Chemical Company	Dowanol DPM	100	94.92	☑	

Conclusion:

The supplied solvents and the DPM comparison product were found to be successful in removing the Hucker's soil using manual cleaning accompanied with a final dry wipe. The dry wipe was needed to remove the residue that remained from the cleaning solvents.