CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2003
DateRun:	05/29/2003
Experimenters:	Jason Marshall
ClientType:	Printing Company
ProjectNumber:	Project #1
Substrates:	Stainless Steel
PartType:	Coupon
Contaminants:	Inks
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To identify alternatives to methylene chloride for ink removal.

Experimental Procedure:

Nine products were selected from the SSL's databases based on client supplied information. Even though the substrate to be cleaned was designated as a textile (cloth t-shirts) the initial testing was conducted on a metal substrate so that a quantitative assessment could be made on the selected cleaners. Six of the cleaners were used at full strength, one was used at 20% as recommended by the vendor and the last two were diluted to 10%. The dilutions were made using DI water. All nine products were poured into 600 ml glass beakers. All solutions were used at room temperature.

Twenty-seven preweighed stainless steel coupons were coated with one of the supplied inks, PolysOne Kennesaw Wiflex MX Mixing Colors -pink (85-68-7, 9002-86-2) using a hand held swab and allowed to dry. After drying, coupons were weighed again to determine the amount of ink applied to each coupon. Three coupons were immersed into each solution and cleaned for five minutes using stir-bar agitation. Coupons were rinsed in tap water at 120 F for 15 seconds and dried using a Master Appliance Heat Gun at 500 F for 1 minute. When coupons cooled to room temperature, final weights were measured and product efficiencies were calculated.

Results:

Only one of the products tested removed over 80% of the ink using immersion cleaning alone. However, several of the products allowed for the ink to be easily wiped off after soaking for five minutes. The following table lists the amount of soil added and removed for immersion cleaning and immersion and wipe cleaning.

Cleaner	Initial wt	Final wt	% Removed
Soy Clear 1500	0.3350	0.3731	-11.37
	0.1579	0.1905	-20.65
	0.3726	0.4192	-12.51
Metabolix E3HB	0.5002	0.4223	15.57
	0.4014	0.3432	14.50
	0.3064	0.2163	29.41
Bio T Max	0.4396	0.0783	82.19
	0.4054	0.0365	91.00
	0.3312	0.0920	72.22
Misprint Stencil	0.3054	0.1947	36.25
	0.2610	0.1602	38.62
	0.5549	0.4100	26.11
EP 921	0.3303	0.2468	25.28
	0.5514	0.4690	14.94
	0.4398	0.3606	18.01
Ink Zapper	0.6794	0.6594	2.94
	0.6682	0.6452	3.44
	0.5475	0.5561	-1.57
California Parts Washer	0.4498	0.4254	5.42
	0.2631	0.2668	-1.41
	0.3906	0.3882	0.61
SC 1000	0.3911	0.3802	2.79
	0.4471	0.4379	2.06
	0.2728	0.2730	-0.07

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Valtron SP 2201	0.3527	0.3487	1.13
	0.1992	0.1925	3.36
	0.6456	0.6370	1.33

Summary:

Substrates:	Stainless Steel
Contaminants:	Inks

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
AG Environmental Products	Soy Clear 1500	100	-14.84	☐	
Metabolix Inc	Metabolix E3HB	100	19.83	☐	
Bio Chem Systems	Bio T Max	100	81.80	☑	
Kyzen Corporation	Misprint Stencil Remover	100	33.66	☐	
Inland Technologies Inc	EP 921	100	19.41	☐	
Vertec BioSolvents	Ink Zapper	100	1.61	☐	
Phase III Inc	California Parts Washer Solution	20	1.54	☑	
Gemtek Products	SC 1000 Aqueous Cleaner Concentrate	10	1.59	☐	
Valtech Corporation	Valtron SP 2201	10	1.94	☐	
AG Environmental Products	Soy Clear 1500	100	96.71	☑	Wipe
Vertec BioSolvents	Ink Zapper	100	97.67	☑	Wipe
Phase III Inc	California Parts Washer Solution	20	99.27	☑	Wipe
Gemtek Products	SC 1000 Aqueous Cleaner Concentrate	10	82.89	☑	Wipe
Valtech Corporation	Valtron SP 2201	10	92.35	☑	Wipe

Conclusion: The successful cleaners will be evaluated on the second supplied ink.