CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1997

DateRun: 07/08/1997

Experimenters: Jason Marshall, Prashant Trivedi

ClientType: Machine Construction Company

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Inks

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric, Visual

Purpose: To determine a replacement for ink removal

Experimental Procedure: Eight steel coupons were weighed after preclean treatment. The coupons were then contaminated with an excess amount of ink. The drying process was sped along through the use of an oven set at 100 C for approximately one hour.
Eight cleaning chemistries (including the customer supplied cleaner) were tested to determine an appropriate replacement. Paper towels were used to apply the cleaners. The time to remove the ink was recorded. In order to keep the experiment practical, a cut off time of five minutes was used. Once the ink was removed, a dry paper towel was used to remove the excess cleaner and ink residue. The samples were allowed to sit overnight and were then reweighed to determine their effectiveness at removing the ink.
SUBSTRATE MATERIAL: stainless steel
CONTAMINANTS: ink---Steel Blue DX-100 solvent based dye
CONTAMINATING PROCESS USED: manual application of ink, dry for 1 hour at 100 C

Results: Of the eight chemistries used, only three showed success in removing the ink. Cleaner number one (cleaner to be replaced) was completely successful in removing the ink. It should be noted that the weight of the coupon after treatment with cleaner number 1 was lower than the pre-cleaned coupon, which may indicate substrate damage. Of the remaining two, number 7 produced a lot of foam and would not be useful to the client. Cleaner number 2 was a terpene based cleaner and had marginal result; however, the cleaner did not produce any foam. The remaining chemistries had no positive cleaning effects.

coupon #		remaining	%cont.	comments
	wt contam	contaminate	remaining	
1	0.0225	-0.0017	-7.56	damage
2	0.0200	0.0135	67.50	
3	0.0114	0.0174	152.63	
4	0.0112	0.0118	105.36	foamy
5	0.0107	0.0099	92.52	foamy***
6	0.0128	0.0140	109.38	foamy
7	0.0181	0.0089	49.17	foamy
8	0.0093	0.0093	100.00	foamy

***some of cleaner #1 cleaned a spot on coupon. #1 was splashed on during experiment, thus removing some of the ink.

Summary:

Substrates:	Stainless Steel				
Contaminants:	Inks				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Accurate Manufactured Products	Safety Layout Blue Remover	100		☐	
Tarksol Inc	Tarksol HTF 321	100		☐	
Oakite Products	Inproclean 1300	100		☐	
Man Gill Chemical Company	Gillite 0650 Cl	100		☐	
MacDermid Industrial Products	ND 17	100		☐	

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Nalge Company	Nalgene L 900	100		☐	
Mirachem Corporation	Mirachem 500	100		☐	
CRC Industries	Complex Blue	100		☐	

Conclusion:

Of the eight chemistries tested, only three showed success in cleaning the ink from the coupons. One cleaner was the client supplied cleaner to be replaced, another produced unwanted foaming action and the final one did not clean a majority of the ink from the coupon.
It was determined from these results to run another experiment using terpene based cleaners that have ink cleaning capabilities.