CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1997
DateRun:	09/18/1997
Experimenters:	Prashant Trivedi
ClientType:	Manufacturer of Security Systems
ProjectNumber:	Project #1
Substrates:	Steel
PartType:	Coupon
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	Find % contaminant removal using supplied cleaners

Experimental Procedure:

The purpose of this experiment was to find the percent contaminant removal using the Oakite solutions supplied by the client.
Coupons were contaminated with the oil using swabs. The coupons were allowed to sit for over an hour. After obtaining the contaminated weights, the three coupons were cleaned per Oakite solutions. The solutions used were sampled by the client at different stages in the bath's life. These stages were taken at: zero month, one month-stagnant, one month-circulating and three month. The same operating conditions were followed as in previous trial.
SUBSTRATE MATERIAL: 1020 Cold rolled steel
CONTAMINANTS: Quaker C1A US oil

Results:

The cleaning efficiency of the solutions decreased as the age of the bath increased. Figure 1 shows a graphical representation of the trend.

In general, the older the bath, the less efficient the cleaner was in removing the oil. It should be noted that the one month sample taken during operating conditions performed better than the one month stagnant sample. This shows that the filtering and coalescing options employed extend the bath life. Table 1 lists the cleaning efficiencies as well as the standard deviations for each cleaner.
Table 1 Percent Removal of Contaminant

	0 M	1M-S	1M-C	3M
	99.00	96.70	97.70	95.60
	99.90	97.70	99.30	91.30
	98.90	98.90	98.80	90.00
Ave	99.30	97.80	98.60	92.30
Std Dev	0.55	1.10	0.82	2.93

0M = Fresh sample
1M-S = 1 month sample-stagnant
1M-C = 1 month sample-circulating
3M = 3 month sample

Enclosed is a listing of the chemistries that can be used with low pressure spray applications. If you see something that you would like to try or to learn more about, just give me a call and I can get the information out to you.

Also included is something I thought you might be interested in. Included was an outline that this company uses when one of their clients is having difficulties. Perhaps you may want to ask Oakite if they are willing to do something similar to this. If not, let them know that other companies are and that you really do not mind switching vendors.

Summary:

Substrates:	Steel				
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Oakite Products	Inproclean 1300	3	98.60	☑	

Conclusion:

The relationship between the age of the cleaning bath and the cleaning efficiency was determined to be: as the bath is used longer, the efficiency decreases. This result was the expected outcome. When more data points are added, a more precise model can be developed to locate the minimum cleaning efficiency of the bath and thus the age at which to change the bath.
Another relationship was discovered during this testing. The two samples collected at the one month period did not have the same cleaning efficiencies. The circulating sample was more effective than the stagnant sample in removing the contaminant from the coupons. An increase in the efficiency during

circulation shows that the filtration and coalescing processes were effective in prolonging the life of the cleaning bath solution.