CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1998

DateRun: 12/02/1998

Experimenters: Jason Marshall

ClientType: Name Plate Mfg-Etching

ProjectNumber: Project #1

Substrates: Liquid

PartType: Coupon

Contaminants: Soaps

Cleaning Methods:

Analytical Methods: Colorimeter

Purpose: To determine a method for bath life monitoring.

Experimental Procedure: A 125mL sample of the Soy Gold product was diluted to 50% by volume using DI water at room temperature. From this stock solution several contaminated solutions were made up using the dirty D-Greeze 500 cleaning solution. Each solution was made in a 15 mL test tube. Using LaMotte's Smart Colorimeter at 420 nm, percent transmittance and absorbance readings were recorded for a blank solution (Soy Gold 50%) and seven solutions. The values were plotted to determine the correlation between contaminant loading and colorimeter readings. Two trials were conducted for %Transmittance and absorbance.
The concentrations used were:

Contaminant	Volume	Stock Volume
%	(mL)	(mL)
0	0	15.00
2.5	0.38	14.62
5.0	0.75	14.25
7.5	1.12	13.88
10.0	1.50	13.50
12.5	1.88	13.12
15.0	2.25	12.75
20.0	3.00	12.00

SUBSTRATE MATERIAL: Liquid-AG Environmental Soy Gold 2000 @ 50%
CONTAMINANTS: Dirty cleaning solution, Solvent Kleen D-Greeze 500 w/ residual paint chips and pumice sludge
CONTAMINATING PROCESS USED: Added known volume to Cleaning Solution
ANALYTICAL METHODS: Colorimeter-%Transmittance and Absorbance at 420 nm

Results: Both %Transmittance and Absorbance were found to have adequate relationships with the amount of contaminant added to the stock solution. These relationships were determined to be exponential in nature. Using spread sheet calculations, the %Transmittance values were found to be a better match than the absorbance data. Table 1 lists the information gathered in Trials 1 and 2.

Table 1. Resultant Data for Trials 1 & 2

Contaminant		Trial 1		Trial 2
Vol %	% Trans	Absorbance	% Trans	Absorbance
0	102	0.01	98	0.01
2.5	84	0.08	82	0.09
5	55	0.26	61	0.27
7.5	59	0.23	57	0.24
10	51	0.29	51	0.29
12.5	45	0.35	45	0.35
15	43	0.37	41	0.39
20	37	0.43	37	0.43

Correlations: 0.953 1.16 0.952 1.16

The Figures 1 & 2 show the %Transmittance relationship to contaminant concentrations.
Figures 3&4 illustrate the absorbance data graphically. These graphs reveal that the values obtained for the 5% may be the reason for the discrepancies in the correlation factors.

Summary:

CLEANING LABORATORY EVALUATION SUMMARY

Substrates:	Liquid				
Contaminants:	Soaps				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
AG Environmental Products	Soy Gold 2000		0.00	☐	

Conclusion: Using a colorimeter, the %Transmittance at 430 nm was determined to be a possible method for monitoring bath life. The next step will be to correlate the %Transmittance readings to cleaning efficiency.