CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999

DateRun: 04/20/1999

Experimenters: Jason Marshall

ClientType: Electron & Ion Technology Co

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To determine the effectiveness of three cleaners at different concentrations.

Experimental Procedure: Three chemistries form the previous test were made into 1 and 3 % solutions using DI water in 400 mL beakers. These solutions were then heated to 130 F on a hot plate. Eighteen preweighed coupons were contaminated with the metal working fluid supplied by the client. Coupons were weighed after contamination. Three coupons were cleaned in each solution for three minutes using stir-bar agitation, then rinsed for 30 seconds in a tap water bath at 120 F. Drying was performed using Master Appliance orp, Hot-air gun model HG-301A at 500 F for one minute. Final weights were recorded and cleaning efficiencies were calculated.

SUBSTRATE MATERIAL: 304 Stainless Steel coupons
CONTAMINANTS: Metal working fluid (Hangsterfer's S-500CF_US)
CONTAMINATING PROCESS USED: Coupons were contaminated using hand-held swab

Results: Each cleaner was effective at removing a vast majority of the metal working fluid from the coupons. Only one product was effective in removing 100% of the contaminant at each of the dilutions tested. Table 1 lists the cleaning efficiencies from the trial.

Table 1. Cleaning Efficiencies

Chemistry	Branson GP		Warren Chemical		Matchless MC 580	
Concentration	1%	3%	1%	3%	1%	3%
Coupon 1	98.76	99.81	100.00	100.00	99.07	98.43
Coupon 2	97.34	99.76	100.22	101.05	99.05	99.17
Coupon 3	99.20	99.05	99.77	99.85	98.38	99.80
Ave	98.43	99.54	100.00	100.30	98.84	99.13
Std Dev	0.97	0.42	0.22	0.65	0.39	0.69

Warren Chemical performed well at all three dilutions. The Branson and Matchless products cleaned comparably at each concentration. Table 2 lists the average cleaning efficiencies for each cleaner.

Summary:

Substrates:	Stainless Steel				
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Branson Ultrasonics	GP	1	98.43	☑	
Branson Ultrasonics	GP	3	99.54	☑	
Warren Chemical Company	Sea Wash Neutral	1	100.00	☑	
Warren Chemical Company	Sea Wash Neutral	3	100.30	☑	
Matchless Metal Polish Company	MC 580	1	98.84	☑	
Matchless Metal Polish Company	MC 580	3	99.13	☑	

Conclusion: Warren Chemical Sea Wash Dispersant was effective in removing 100% of the metal working fluid at the three concentrations tested. The Branson GP and Matchless MC 580 cleaned at the same levels for each dilution evaluated. The next phase will be to clean client supplied parts using the three chemistries tested here, at 5%, as well as tap water. Evaluation will be performed using OSEE.