CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999

DateRun: 04/27/1999

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 one cleaner requested by client at different concentrations.

Experimental Procedure: The one chemistry was made into 1, 3 and 5% solutions using DI water in 400 mL beakers. These solutions were then heated to 130 F on a hot plate. Nine 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 Corp, 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)

Results: All three concentrations were very effective in removing the contaminant from the stainless-steel surface. Efficiencies ranged from 98.5 to 102%. It was noted that when the coupons were submerged into the rinse water, a noticeable amount of the cleaning solution was still on the coupon. The level was higher for the lower dilutions. Table 1 list the efficiencies for the three concentrations tested.

Table 1. Cleaning Efficiencies

Brulin 815 GD	1%	3%	5%
Coupon 1	98.48	100.26	100.57
Coupon 2	99.43	100.99	101.59
Coupon 3	99.90	102.07	101.06
Ave	99.27	101.11	101.08
Std Dev	0.72	0.91	0.51

Table 2 compares the cleaning efficiencies of previously tested cleaners with Brulin 815 GD. The Brulin product performed better than all of the other cleaners at each concentration except at 1% where Warren chemical was slightly more efficient.

Table 2. Comparison of Average Cleaning Efficiencies

Concentration	% by Volume	1	3	5
Branson	GP	98.43	99.54	100.24
Warren Chemical	Sea Wash Dispersant	100	100.3	100.07
Matchless	MC 580	98.84	99.13	100.24
Brulin	815 GD	99.27	101.1	101.1

Summary:

Substrates:	Stainless Steel				
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Brulin Corporation	Formula 815 GD	1	99.27	☑	
Brulin Corporation	Formula 815 GD	3	101.11	☑	
Brulin Corporation	Formula 815 GD	5	101.08	☑	

Conclusion: The Brulin product was determined to remove the contaminant at each of the three concentrations tested.