

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999
 DateRun: 04/11/1999
 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 evaluate several potential replacement cleaners and compare them to current cleaner.
 Experimental Procedure: Five cleaning chemistries were selected based on vendor supplied information and from searching the lab's Effective Test Conditions Database. A sixth chemistry, supplied by the client, was included in the testing. Each solution was made into 5% solutions using DI water in 400 mL beakers. These solutions were then heated to 130 F on a hot plate. Tap water was also used to clean coupons.
 Twenty-one 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)
 CONTAMINATING PROCESS USED: Coupons were contaminated using hand-held swab

Results: *A sample of one of the client requested cleaner's, Brulin 815 GD, has been ordered by the lab and will be tested. All of the cleaners tested, including the water, were very effective in removing the metal working fluid from the stainless-steel coupons. There was noticeable residue on all the coupons without 100% cleaning. Table 1 lists the efficiencies for each cleaner tested.

Table 1. Cleaning Efficiencies

Cleaner	Branson	Matchless	Oakite	Warren	Gemtek	Savogran	Water
Coupon 1	100.00	100.13	97.82	100.00	99.74	99.86	98.87
Coupon 2	100.00	100.42	100.00	100.07	99.64	99.71	98.52
Coupon 3	100.71	100.18	100.00	100.13	99.69	99.64	96.86
Ave	100.24	100.24	99.27	100.07	99.69	99.74	98.09
Std Dev	0.41	0.15	1.26	0.07	0.05	0.11	1.07

PRODUCT IDENTIFICATION

CONTAMINANTS SUBSTRATES EQUIPMENT

Brulin: This is a table listing vendor supplied information on the products.
 Matchless: Find it in chem search new in My Documents or in the client notebook.
 Oakite
 Warren Chemical
 Gemtek
 Savogran

Summary:

Substrates:	Stainless Steel				
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil				
Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Branson Ultrasonics	GP	5	100.24	<input checked="" type="checkbox"/>	current cleaner
Matchless Metal Polish Company	MC 580	5	100.24	<input checked="" type="checkbox"/>	
Oakite Products	Inproclean 3800	5	99.27	<input checked="" type="checkbox"/>	
Warren Chemical Company	Sea Wash Neutral	5	100.07	<input checked="" type="checkbox"/>	

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Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	5	99.69	<input checked="" type="checkbox"/>	
Savogran Company	Dirtex Prepaint Cleaner	5	99.74	<input checked="" type="checkbox"/>	
Water	Water	100	98.09	<input checked="" type="checkbox"/>	

Conclusion:

All cleaners tested removed over 98% of the metal working fluid from the stainless-steel coupons. The next test will be to evaluate cleaning of the three cleaners with 100% efficiencies using lower concentrations (1 and 3% by volume).