CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2000

DateRun: 01/03/2000

Experimenters: Jason Marshall, Nicole Vayo

ClientType: Department of Public Works

ProjectNumber: Project #1

Substrates: Aluminum, Brass, Copper, Nickel, Stainless Steel

PartType: Coupon

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

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate client requested cleaners based on Vendor supplied information.

Experimental Procedure: The cleaners used were diluted to 5% using DI water in 600 ml beakers. Cleaning of the coupons was performed using stir-bar agitation at 130 F for five minutes. Coupons were rinsed using tap water at 120 F for two minutes and dried at room temperature for two hours. Gravimetric analysis was used to determine effectiveness.

SUBSTRATE MATERIAL: Table 1 lists the coupons materials used
Table 1. Substrates

Aluminum	202-2024 T-3
	202-7075 T-6
Stainless Steel	202-410 B-85
Brass	202-260
Cold Rolled Steel	202-1020

CONTAMINANTS: Table 2 lists the contaminants and their CAS#s
Table 2. Contaminants Used

Contaminant	CAS #			
oil	64741-89-5	64742-53-6	64741-44-2	
lubricant	64742-57-0	8052-42-4	64742-62-7	64742-47-8
grease	64742-47-8			

CONTAMINATING PROCESS USED: All contaminants were applied to coupons using handheld swabs.

Results: The Mirachem 500 that is kept in-stock at the laboratory was the most effective in removing all three contaminants tested. The Ready-to-Use Mirachem 500 and the Solution 2000 did not perform as well at removing the lubricant. The RTU Mirachem 500 may have already been diluted before testing, thus showing lower results. The lubricant on the coupons cleaned by Solution 2000 was a little thicker due to sitting on the benchtop overnight. The Solution 2000 might have done better using new lubricant. Table 4 lists the cleaning results obtained for the three cleaning solutions and the three contaminants.

Table 4. Cleaning Results

Company Name	Product Name	Contaminant	CAS #	Efficiency
Ensolve Biosystems	Grease Feast	oil	64741-89-5	94
		grease	64742-47-8	100
		lubricant	64742-47-8	88
United Laboratories	United 2002 Harvest Gold	oil	64741-89-5	66
		oil	64742-53-6	66
		oil	64741-44-2	66
		lubricant	8052-42-4	-12
		lubricant	64742-57-0	-12
		lubricant	64742-62-7	-12

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		grease	64742-47-8	65
United Laboratories	United 450 All Clear	oil	64741-89-5	95
		oil	64742-53-6	95
		oil	64741-44-2	95
		lubricant	64742-57-0	91
		lubricant	8052-42-4	91
		lubricant	64742-62-7	91
		grease	64742-47-8	100

Summary:

Substrates:	Aluminum, Brass, Copper, Nickel, Stainless Steel
Contaminants:	Cutting/Tapping Fluids, Greases, Lubricating/Lapping Oils, Oil

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
EnviroSan Products Ltd	Solution 2000	5	96.00	☑	oil
EnviroSan Products Ltd	Solution 2000	5	43.00	☐	lubricant
EnviroSan Products Ltd	Solution 2000	5	96.00	☑	grease
JDI Inc	Mirachem 500 RTU	5	99.00	☑	oil
JDI Inc	Mirachem 500 RTU	5	76.00	☐	lubricant
JDI Inc	Mirachem 500 RTU	5	94.00	☑	grease
Mirachem Corporation	Mirachem 500	5	92.00	☑	oil
Mirachem Corporation	Mirachem 500	5	91.00	☑	lubricant
Mirachem Corporation	Mirachem 500	5	99.00	☑	grease

Conclusion:

The in-stock Mirachem 500 was the superior product according to the results obtained, because it worked on all three contaminants. The 99% removal of oil and 94% removal of grease indicate the Ready-to-Use Mirachem 500 might be the better product if it is used straight from the spray bottle (to be conducted at a later date). Higher concentrations of Solution 2000 may produce better results.