CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1997

DateRun: 07/15/1997

Experimenters: Jason Marshall, Prashant Trivedi

ClientType: Biomedical Device Manufacturer

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Lubricating/Lapping Oils

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: First attempt to clean lubricant.

Experimental Procedure: Twenty four stainless steel coupons were weighed after the preclean treatment. The coupons were then contaminated with a lubricant and placed in an oven at 400 F for 10 minutes to simulate the process the client currently uses. After the coupons cooled down to room temperature, the contaminated weight was obtained.
Eight cleaning chemistries were chosen on the basis of their abilities to clean lubricants and grease off stainless steel surfaces from previous laboratory testing. The chemistries chosen were made into 10% solutions based on volume. The solutions were then heated to approximately 120 F on hot plates. Three coupons were placed into each solution for a period of 10 minutes with stir-bar agitation. Upon completion of the cleaning time, the coupons were rinsed with tap water in beakers with stir-bar agitation at 120oF for two minutes followed by drying with a hot air gun at 115 F. The coupons were then allowed to cool down to room temperature and the cleaned weight was recorded.
SUBSTRATE MATERIAL: Stainless Steel
CONTAMINANTS: Lubri-temp Anti-Seize lubricant
CONTAMINATING PROCESS USED: Coupons were contaminated with the client supplied lubricant and placed in an oven at 400oF for 10 minutes.

Results: Of the eight chemistries selected, five showed good to excellent cleaning capabilities. The three solutions that did not perform well will not be further considered. The remaining chemistries will be tested using an ultrasonic unit.
During the trial, observations were made about each chemistry. 2000XS was noted to need less cleaning time. CT-1 was not outstanding in its removal of the contaminate. Geo Guard refouled the coupons upon the coupons removal from the cleaning solution. Sea-Wash appeared to need a shorter cleaning time. ND-17 looked like it might be recontaminating the coupons
when the coupons were removed from the cleaning solution. Daraclean needed the full cleaning time and it left a layer of contamination on top of the bath. Inproclean had excellent removal of the lubricant, thus needing less cleaning time. Valtron did not show any signs of removing the lubricant during the cleaning time.
The rinsing process could use agitation to limit the amount of contamination that is redeposited on the coupons upon removal. An increase in temperature and/or drying time might be useful in removing the excess water that remained after the current drying process.

Percent Contaminate Removed								
	2000XS	CT-1	Geo Guard	Sea Wash	ND-17	Daraclean	Inproclean	Valtron
	68.90	31.40	49.20	63.30	88.60	70.30	96.10	16.10
	96.50	18.90	62.90	80.30	97.60	87.90	126.00	14.90
	94.40	25.60	38.40	89.70	89.40	89.90	96.80	21.20
Average	86.60	25.30	50.20	77.80	91.90	82.70	106.00	17.40
std dev	15.40	6.30	12.30	13.40	5.00	10.80	17.10	3.30

Summary:

Substrates:	Stainless Steel
Contaminants:	Lubricating/Lapping Oils

Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
US Polychem Corporation	Polychem A 2000 XS	10	86.60	☑	
Chemkleen International Inc.	CT 1 Multipurpose Cleaner	10	25.30	☐	
Calgon Corporation	Geo Guard 2215	10	50.20	☐	
Warren Chemical Company	Sea Wash Neutral	10	77.80	☑	
	ND 17	10	91.90	☑	

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MacDermid Industrial Products					
Magnaflux	Daraclean 282	10	82.70	☑	
Oakite Products	Inproclean 3800	10	106.00	☑	
Valtech Corporation	Valtron SP 2275	10	17.40	☐	

Conclusion: Five of the eight chemistries showed good to excellent removal of the lubricant and will be used in conjunction with an ultrasonic unit in the 40KHz range. The chemistries selected were: 2000XS, Sea-Wash, ND-17, Daraclean, and Inproclean.