CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999

DateRun: 12/19/1999

Experimenters: Jason Marshall

ClientType: Medical Instrument Mfr

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Greases, Lubricating/Lapping Oils

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To further evaluate potential cleaners using ultrasonic energy.

Experimental Procedure: Seven cleaning chemistries were selected based on the previous trial results. Five of these products were diluted to five percent and one to two percent by volume in 600 ml beakers using DI water. These six solutions were heated to 130 F on a hot plate. The seventh product was used at full strength at room temperature. Table 1 lists the products evaluated. Twenty-one preweighed stainless steel coupons were coated with the buffing compound and dried for 30 minutes at room temperature and weighed again. (Note: The six contaminants provided were sub-grouped according to their make up. There were three Aluminum Oxide based buffing compounds, two mineral oil based products and one other. Separate testing will be performed according to these classifications.)

Three coupons were cleaned for three minutes in a beaker using a Crest 40 kHz ultrasonic tank model 4Ht 1014-6. Coupons were rinsed in DI water at 130 F for 30 seconds and dried using a Master Appliance Corp, Hot-air gun model HG-301A at 500 F for one minute. After the coupons cooled to room temperature, a final clean weight was recorded and cleaning efficiencies were calculated.

SUBSTRATE MATERIAL: Stainless steel coupons (202-316 B-80)
CONTAMINANTS: Snowden-Pencer F-26 Grease Stick Polishing Lubricant (CAS#s: 64742-52-5, 68815-16-7, 67701-27-3, 102-71-6)
CONTAMINATING PROCESS USED: Coupons covered with contaminant and air dried for 30 minutes.

Results: The six aqueous based products worked well in conjunction with the ultrasonic energy. It was noted that the cleaners required the full three minutes to remove the contaminant from the coupons. Table 2 lists the cleaning efficiencies for all seven products.

Table 2. Cleaning Results

Cleaner:	Safe Science	Oakite	Texo Corp	US Polychem	Valtech	WR Grace	International
Coupon 1	81.01	98.12	100.00	99.94	99.86	100.00	100.06
Coupon 2	81.92	98.31	99.21	99.53	100.09	99.78	99.89
Coupon 3	90.95	99.80	99.73	99.09	99.76	99.75	100.18
Average	84.63	98.74	99.65	99.52	99.90	99.84	100.05

Summary:

Substrates:	Stainless Steel				
Contaminants:	Greases, Lubricating/Lapping Oils				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Safe Science Inc	Safe Science Engine Degreaser (Industrial)	100	84.63	☐	
Oakite Products	Inproclean 3800	5	98.74	☑	
Texo Corporation	Texolite 1734 XL	5	99.65	☑	
US Polychem Corporation	Polychem A 2000 XS	5	99.52	☑	
Valtech Corporation	Valtron SP 2250 2LF	5	99.90	☑	
Magnaflux	Daraclean 282 GF	5	99.84	☑	
International Products Corporation	Micro 90 Conc.	2	100.05	☑	

Conclusion: The six aqueous products removed 98-100% of the contaminant using ultrasonic energy. These six will be used on the last type of contaminant and then on supplied parts.