CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2002
DateRun:	10/17/2002
Experimenters:	Jason Marshall
ClientType:	Manufacturing
ProjectNumber:	Project #1
Substrates:	Stainless Steel
PartType:	Part
Contaminants:	Oil
Cleaning Methods:	Ultrasonics
Analytical Methods:	OSEE
Purpose:	To use OSSE to determine cleanliness of parts cleaned with new products
Experimental Procedure:	Two products from the previous trial were selected for cleaning supplied parts. One was diluted to 5% and the other was diluted to 3% using DI water in 1500 ml beakers. Both products were heated to 130 F on a hot plate. Each solution was degassed for 5 minutes in a Crest 40 kHz ultrasonic tank. OSEE readings for five supplied parts were recorded using a PET SQM 100. Six readings were made for each side (Top-knife edge and Bottom). One part was then cleaned using Acetone. Two parts were cleaned in each solution for 6 minutes using ultrasonic energy. Parts were rinsed in DI water at 120 F for 15 seconds followed by drying with a Master Appliance Heat Gun at 500 F for 30 seconds. Once dry parts were dry, OSEE readings were recorded. The parts were then visibly inspected and wiped with a white towel soaked with Acetone to determine cleanliness. Contaminant: Milacron Marketing Company CIMTECH® 310 metal working fluid concentrate (102-71-6, 78-96-6, 26896-20-8)
Results:	The parts cleaned in the ultrasonic tank resulted in higher OSEE readings than the Acetone wiped part. All cleaned parts had higher average readings than the initial dirty readings. The average Dirty reading was found to be 209 with a standard deviation of 35. The clean readings had a higher standard deviation but were still greater than the dirty readings. The average Clean OSEE readings was 578 with a standard deviation of 220. The table below lists all readings made, averages for top and bottom, overall part average and finally the total average.

Table 1. OSEE Readings.

Cleaner	Part	OSEE Dirty T	OSEE Dirty B	OSEE Cleaned T	OSEE Cleaned B
Acetone	1	154	195	277	349
		197	219	369	378
		229	208	361	390
		252	221	250	363
		261	203	361	498
		189	263	436	440
	Average	214	218	342	403
	Overall Ave	216		373	
Citrinox	2	153	108	882	262
		168	177	847	652
		193	244	833	871
		213	285	695	799
		210	272	782	781
		223	233	350	963
	Average	193	220	732	721
	Overall Ave	207		726	
Citrinox	3	180	175	730	279
		213	186	840	607
		209	194	810	542
		181	184	727	648
		254	212	774	624
		258	215	902	758

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	Average	216	194	797	576
	Overall Ave	205		687	
Daraclean	4	162	183	574	278
		204	230	414	295
		218	247	443	574
		188	246	853	630
		202	208	281	519
		245	189	429	623
	Average	203	217	499	487
	Overall Ave	210		493	
Daraclean	5	133	182	451	604
		183	192	962	336
		207	195	960	665
		192	201	424	637
		261	225	962	453
		250	248	236	674
	Average	204	207	666	562
	Overall Ave	206		614	
		Total Dirty Average		Total Clean Average	
		209		578	

When the parts were wiped, only one part was thought to have any noticeable black residue on it. The one part was cleaned in the Citranox. Upon further review under a microscope, the mark was indistinguishable from other sections of the wipe, and therefore the mark was considered to not be dirt. The wipe that was used to clean the part with Acetone clearly had dirt all over.

Summary:

Substrates:	Stainless Steel				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Alconox Inc	Citranox	3	0.00	☑	
Magnaflux	Daraclean 282	5	0.00	☑	

Conclusion: Both cleaners were found to be very effective in removing the black dirt from the supplied parts.