CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2002
DateRun:	10/20/2002
Experimenters:	Jason Marshall
ClientType:	Manufacturing
ProjectNumber:	Project #1
Substrates:	Stainless Steel
PartType:	Part
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Metal fines, Oxides, Oil
Cleaning Methods:	Ultrasonics
Analytical Methods:	OSEE
Purpose:	To clean additional supplied parts and analyzing using OSEE
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. Multiple readings were made for each of the parts. 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:	Both cleaners were very successful in removing the machining fluids and other contaminants from the outside of the parts. It was observed that there was some black residue on one end of the insides of the "T" parts. This was probably due to the way the parts were placed into the beakers. As the parts were cleaned, one end of the "T" was partially out of the cleaning solution for a portion of the cleaning cycle. If the parts were cleaned in the ultrasonic tank alone, the black residue would have been removed. The table below lists the readings made for the two cleaners and acetone.

Table 1. OSEE Readings

Cleaner	Part	OSEE DIRTY		Average	OSEE Clean		Average
Acetone	T1	132	122		148	156	
		149	112		158	185	
		53	63		136	202	
		136	143		166	177	
		90	99	110	166	159	165
Acetone	E1Body	146			259		
		148			145		
		100			204		
		124			190		
		166			205		
		296		163	466		245
Citranox	T2	122	216		249	228	
		114	109		298	338	
		160	174		286	351	
		199	297		285	263	
		130	166	169	234	201	273
Citranox	E2 Body	190			225		
		97			254		
		121			283		
		70			175		
		123			229		
		178		130	358		254
Citranox		254			330		

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	E2 Ring						
		165			317		
		217			342		
		291			329		
		252			356		
		285		244	305		330
Citranox	T3	147	131		305	279	
		123	136		272	250	
		201	185		344	284	
		166	109		235	261	
		132	110	144	267	263	276
Daraclean	E3 Body	101			599		
		189			620		
		217			538		
		202			547		
		174			569		
		117		167	586		577
Daraclean	E3 Ring	64			263		
		78			321		
		121			485		
		149			459		
		116			483		
				106	563		429
Daraclean	T4	194	133		408	263	
		213	201		485	437	
		188	129		501	486	
		164	233		378	499	
		172	169	180	408	383	425
Daraclean	E4 Body	116			222		
		166			299		
		226			276		
		105			223		
		104		148	231		277
Daraclean	E4 Ring	240			252		
		150			388		
		337			292		
		300			391		
		231			666		
		304		260	474		411

The next table summarizes the cleaning results for the products evaluated.

Table 2. Summary Data

	Dirty		
	T	E	E Ring
Overall	151	152	203
	Clean		
	T	E	E Ring
Citranox	275	254	330
Daraclean	425	427	420
Acetone	165	245	
	288	308	298

Summary:

Substrates:	Stainless Steel
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Metal fines, Oxides, Oil

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Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Alconox Inc	Citranox	3	0.00	☑	
Magnaflux	Daraclean 282	5	0.00	☑	

Conclusion: Both products were very successful in cleaning the supplied parts. The results suggest that the Daraclean 282 cleaned the parts better than the Citranox and Acetone.