CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1996
DateRun:	05/01/1996
Experimenters:	Jay Jankauskas
ClientType:	Chemical Company
ProjectNumber:	Project #1
Substrates:	Stainless Steel
PartType:	Coupon
Contaminants:	Carbon Deposits, Cutting/Tapping Fluids, Greases, Lubricating/Lapping Oils, Oil
Cleaning Methods:	Immersion/Soak
Analytical Methods:	
Purpose:	Remove baked on oil and grease
Experimental Procedure:	On the following pages are the results from the testing performed yesterday. The following cleaning conditions were used: Baked On Oil Mixture Cleaned for 5 minutes in a beaker with no agitation. Rinsing was for 30 seconds in a beaker with a 10% solution of Buckeye Shopmaster Lithium Grease Cleaned for 10 minutes in a beaker with stir-bar agitation. Rinsing was also for 30 seconds with a 10% solution of Buckeye Shopmaster.

Results:

Cleaning Solution: 15% Solution of Bio-T Max					
OIL					
coupon	substrate	clean	dirty	cleaned	percent
23	302	63.0332	63.1487	63.0505	0.85
24	302	63.1730	63.2796	63.2056	0.69
grease					
coupon	substrate	clean	dirty	cleaned	percent
19	316	60.7662	61.6397	61.6400	-0.01
20	316	59.6282	60.5947	60.5942	0.01
21	316	60.7123	61.6144	61.6140	0.01
oil	Average	0.77	std dev		0.11
grease		0.00			0.01
Cleaning Solution: 15% Solution of Terpene Technologies HTF 10B					
oil					
coupon	substrate	clean	dirty	cleaned	percent
14		63.0073	63.0404	63.0227	0.53
15		62.8329	63.1210	62.8400	0.96
16		63.0599	63.2534	63.0643	0.98
grease					
coupon	substrate	clean	dirty	cleaned	percent
10		60.6422	61.4592	61.4521	0.01
11		59.4874	60.1590	60.1331	0.04
12		59.5422	60.1405	60.1404	0.01
oil	Average	0.83		std dev	0.25
grease		0.02			0.02
Cleaning Solution:10% Solution of Safety Kleene Aqueous Cleaner					
oil					
coupon	substrate	clean	dirty	cleaned	percent
7		62.9398	62.9518	62.9503	0.13
8		63.1198	63.1335	63.1308	0.20
9		63.0821	63.1178	63.1035	0.40

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grease					
coupon	substrate	clean	dirty	cleaned	percent
25		60.6306	61.4385	61.4368	0.01
26		60.4338	61.1508	61.1519	-0.01
27		60.6260	61.6103	61.6054	0.04
oi	Average	0.24		std dev	0.14
grease		0.02			0.01
Cleaning Solution: 10% Solution of Safety Kleene Green Solvent					
oil					
coupon	substrate	clean	dirty	cleaned	percent
4		62.8570	62.9619	62.8616	0.95
5		63.1104	63.1742	63.1179	0.88
6		63.1353	63.1668	63.1493	0.56
grease					
coupon	substrate	clean	dirty	cleaned	percent
4		59.3884	60.1938	59.3937	0.99
5		59.4122	60.2694	59.4167	0.99
6		59.3578	59.9437	59.3787	0.96
oil	average	0.80	std dev		0.21
grease		0.98			0.01
Cleaning Solution: 10% Solution of Buckeye Shopmaster					
oil					
coupon	substrate	clean	dirty	cleaned	percent
17		63.0592	63.1298	63.0720	0.82
18		63.0918	63.1758	63.1062	0.83
19		63.1899	63.2544	63.1988	0.86
grease					
coupon	substrate	clean	dirty	cleaned	percent
13		60.6354	61.5455	61.5729	-0.03
14		59.4317	60.2272	60.2660	-0.05
15		59.4579	60.3714	60.3954	-0.03
oil	average	0.84	std dev		0.02
grease		-0.04			0.01
Cleaning Solution: Twin Rivers Aliphatic Ester					
oil					
coupon	substrate	clean	dirty	cleaned	percent
10		63.1169	63.1629	63.1366	0.571739
11		63.1563	63.1877	63.1755	0.388535
12		62.5434	62.5635	62.5601	0.169154
grease					
coupon	substrate	clean	dirty	cleaned	percent
7		59.4273	59.9600	59.4546	0.95
8		59.4618	60.3706	59.5332	0.92
9		60.6318	61.5257	60.7028	0.92
oil	average	0.38	std dev		0.20
grease		0.93			0.02
Cleaning Solution: Twin Rivers Graffiti Remover					
oil					
coupon	substrate	clean	dirty	cleaned	percent
25		62.5826	62.6289	62.6039	0.54
27		63.2869	63.3185	63.3054	0.42
28		62.9276	63.1563	62.9520	0.89
grease					
coupon	substrate	clean	dirty	cleaned	percent

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22		60.5770	61.5722	60.9039	0.67
23		60.7098	61.5543	60.8916	0.78
24		59.5551	60.4234	60.0151	0.47
oil	average	0.62	std dev		0.25
grease		0.64			0.16
Cleaning Solution: Twin Rivers Emulsified Ester					
oil					
coupon	substrate	clean	dirty	cleaned	percent
20		63.0172	63.0958	63.0507	0.57
21		63.2611	63.3712	63.2869	0.76
22		63.0732	63.1824	63.0934	0.82
grease					
coupon	substrate	clean	dirty	cleaned	percent
16		60.6268	61.3589	61.3324	0.04
17		60.6234	61.6174	61.5975	0.02
18		59.6342	60.3488	60.2949	0.07
oil	average	0.72	std dev		0.13
grease		0.04			0.02
Cleaning Solution: Cold clean with Twin Rivers Aliphatic Ester					
Grease					
coupon	substrate	clean	dirty	cleaned	percent
22		60.0108	60.8169	60.6998	0.14
23		60.1082	60.8434	60.6865	0.21
24		60.231	61.2578	61.2042	0.05
grease	average	0.14	std dev		0.08

Removal of Lithium Grease		
	% Removal	Std Dev
Sk Solvent	98.41	1.71
Warm Ester	93.03	1.6
Graffiti Remover	64.21	15.93
Cold Ester	13.69	8.09
Emulsified Ester	4.39	2.84
HTF 10B	1.58	2.01
Sk Aqueous	0.18	0.33
BioT	0.02	0.04
Shopmaster	-3.5	1.2

Removal of Burnt Motor Oil, Antifreeze and Aluminum Dust		
	% Removal	Std Dev
Shopmaster	83.64	2.27
HTF 10B	82.91	15.49
Sk Solvent	79.8	21.32
BioT	77.22	11.03
Emulsified Ester	71.82	12.74
Graffiti Remover	61.59	24.83
Warm Ester	37.64	20.16
Sk Aqueous	24.09	14.29
Cold Ester	13.7	8.09

Summary:

Substrates:	Stainless Steel				
Contaminants:	Carbon Deposits, Cutting/Tapping Fluids, Greases, Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Bio Chem Systems	Bio T Max	15	37.65	☐	
Tarksol Inc	Tarksol HTF 85 B	15	82.91	☑	
Safety Kleen Corporation	Safety Kleen Aqueous Cleaner	10	24.09		

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Safety Kleen Corporation	Safety Kleen Aqueous Cleaner	10	98.42	☑	
Buckeye International	Shopmaster	10	83.64	☑	
Twin Rivers Technologies	Graffiti Remover	100	93.03	☐	
Twin Rivers Technologies	Graffiti Remover	100	64.22	☐	
Twin Rivers Technologies	Methyl Ester 1618	100	93.03	☑	

Conclusion: Quite a bit of the Ester was still on the coupons when I weighed them this morning, so this threw off the results a bit especially on the baked-on oil mixture. All in all, though, the results looked pretty good.