CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1995
DateRun:	09/06/1995
Experimenters:	Donald Garlotta, Jay Jankauskas
ClientType:	Metal Wire Manufacturer
ProjectNumber:	Project #1
Substrates:	Aluminum, Stainless Steel
PartType:	Coupon
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Black light, Gravimetric
Purpose:	To find cleaning chemistries
Experimental Procedure:	The purpose of this trial is to find cleaning chemistries that would be suitable for Metal Wire Manufacturer's needs. 30 coupons of three different substrates (6061 Al, 302 SS and 316 SS) were weighed and then contaminated with the Magnacool CC Oil. The coupons were weighed again, and the oil was allowed to set on the substrate overnight (20 hours). 10 general cleaning chemistries were chosen to be tested. Each cleaning chemistry was used at its minimum recommended concentration (.5% to 5%). For each cleaning solution, one of each substrate was cleaned. Cleaning was done at 120 F for five minutes in a beaker of cleaning solution without any agitation. The coupons were then rinsed for 30 seconds in a tap water bath set at 110 F. After rinsing the coupons were run under air knives for one minute and further dried in a convection oven for 15 minutes at 140 F. The coupons then cooled down for one hour and were weighed to get a percent removal. The coupons were examined under a black light to notice any fluorescing of oil. SUBSTRATE MATERIAL: #1- 6061 Aluminum Coupons, #2- 302 Stainless Steel Coupons, #3- 316 Stainless Steel Coupons CONTAMINANTS: Magnacool CC CONTAMINATING PROCESS USED: Oil applied on with swab and allowed to set for 20 hours
Results:	Even though minimal cleaning conditions were used, most cleaners performed well. The Magnacool CC is a relatively easy fluid to remove.

GRAVIMETRIC ANALYSIS

MacDermid ND-17

Substrate	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
Al	21.1570	21.1905	21.1572	0.0333	99.40%
SS 316	59.4618	59.5016	59.4664	0.0352	88.44%
SS 302	62.5858	62.6188	62.5869	0.0319	96.67%
			Overall % Removal		94.84%

Sky Products Cleaner #10

Substrate	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
Al	21.1325	21.1602	21.1333	0.0269	97.11%
SS 316	60.6400	60.6666	60.6523	0.0143	53.76%
SS 302	62.9302	62.9638	62.9388	0.025	74.40%
			Overall % Removal		75.09%

Innovative Organics Amberclean L12

Substrate	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
Al	21.1515	21.1881	21.1516	0 .0365	99.73%
SS 316	59.6385	59.6513	59.6414	0.0099	77.34%
SS 302	63.0943	63.1292	63.0981	0.0311	89.11%

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			Overall % Removal	88.73%

International Products Corp. Micro

Substrate	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
Al	21.1490	21.1855	21.1480	0.0375	102.74%
SS 316	60.6379	60.6571	60.6463	0.0108	56.25%
SS 302	63.0841	63.1499	63.1007	0.0492	74.77%
			Overall % Removal		77.92%

CSI Release

sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
Al	21.1134	21.1465	21.1140	0.0325	98.19%
SS 316	59.4348	59.4513	59.4380	0.0133	80.61%
SS 302	63.1224	63.1451	63.1244	0.0207	91.19%
			Overall % Removal		89.99%

Calgon Corp. Geo-Guard 2215

sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
Al	21.1492	21.1922	21.1495	0.0427	99.30%
SS 316	60.5591	60.5771	60.5610	0.0161	89.44%
SS 302	63.1131	63.1964	63.1209	0.0755	90.64%
			Overall % Removal		93.13%

AW Chesterton Company KPC 820N

sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
Al	21.1361	21.2045	21.1367	0.0678	99.12%
SS 316	59.5597	59.5857	59.5636	0.0221	85.00%
SS 302	62.9426	62.9656	62.9471	0.0185	80.43%
			Overall % Removal		88.19%

Brulin Corporation 815 GD

sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
Al	21.1259	21.1636	21.1261	0.0375	99.47%
SS 316	59.4338	59.5236	59.4467	0.0769	85.63%
SS 302	63.2640	63.3087	63.2649	0.0438	97.99%
			Overall % Removal		94.36%

WR Grace Daraclean 283

sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
Al	21.1604	21.1912	21.1610	0.0302	98.05%
SS 316	59.4677	59.5302	59.4683	0.0619	99.04%
SS 302	63.0103	63.0686	63.0114	0.0572	98.11%
			Overall % Removal		98.40%

Oakite Products Inc. Inproclean #3800

sample #	clean mass (g)	mass with contamination (g)	mass after	contaminant removed (g)	Percent Removal

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			cleaning (g)		
Al	21.1153	21.1507	21.1160	0.0347	98.02%
SS 316	60.6371	60.6828	60.6383	0.0445	97.37%
SS 302	63.0621	63.0872	63.0628	0.0244	97.21%
			Overall % Removal		97.54%

Summary:

Substrates:	Aluminum, Stainless Steel
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
MacDermid Industrial Products	ND 17	3	94.84	☑	
Sky Products Company Inc	Cleaner #10	3	75.09	☐	
Innovative Organics Inc	Amberclean L 12	5	88.73	☐	
International Products Corporation	Micro (no longer available)	5	77.92	☐	
Cleaning Systems	Release	3	89.99	☑	
Calgon Corporation	Geo Guard 2215	3	93.13	☑	
AW Chesterton	KPC 820 N	4	88.19	☐	
Brulin Corporation	Formula 815 GD	3	94.36	☑	
Magnaflux	Daraclean 283	2	98.40	☑	
Oakite Products	Inproclean 3800	3	97.54	☑	

Conclusion: All the cleaners that obtained a removal of 90% or better will be tested to see if they are compatible with the samples from Metal Wire Manufacturer.