CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2000
DateRun:	05/16/2000
Experimenters:	Jason Marshall, Nicole Vayo
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Aluminum, Brass, Stainless Steel
PartType:	Coupon
Contaminants:	Cutting/Tapping Fluids, Greases, Lubricating/Lapping Oils, Oil
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To compare cleaning efficiency of cleaning product for several dilution ratios.

Experimental Procedure:

An initial evaluation was performed using the new and old formulation of the cleaning chemistry. Both solutions were used at the vendor recommended dilution ratios. Three contaminants and substrates were selected based on suggested compatibilities. Three preweighed coupons were coated with a single contaminant. Cleaning took place at room temperature for five minutes using a stir bar agitation. Coupons were rinsed in tap water at room temperature and dried using a Master Appliance Corp, Hot-air gun model HG-301A at 500 F for one minute. The final weights of the coupons were measured and the cleaning efficiencies were calculated.

The second half of the experiment was performed to compare different concentrations of the newer formulation. In this test, only oil on stainless steel coupons were used. All other cleaning operations were kept the same. The formulations and concentrations used are listed in Table 1.

Table 1. Chemistry and Dilution
Product Formulation Dilution Ratio's
Sea Wash 700 Old 1:12
Sea Wash 700 N 1:24
Sea Wash 700 N 1:06
1:20
1:12
1:28
1:36

SUBSTRATE MATERIAL: Aluminum, Brass and Stainless steel coupons
CONTAMINANTS: Grease, Lubricant and Oil
CONTAMINATING PROCESS USED: Coupons coated using swab

Results:

In Part 1, both formulations were very effective in removing the grease, lubricant and oil from the corresponding substrates. The old formulation appeared to have better cleaning than the new, improved product. Sea Wash 700 averaged just under 100% while the 700 N only removed 96% of the contaminants. Table 2 lists the results of the formulation comparison.

Table 2. Old and New Formula Performance

Sea Wash 700 Old			Sea Wash 700 New		
Al Gr	Br Lu	SS Oi	Al Gr	Br Lu	SS Oi
99.07	100.05	99.93	98.18	96.66	98.25
100.11	100	99.4	95.1	90.54	98.41
100.17	99.93	97.52	98.01	89.23	100.08
99.79	99.99	98.95	97.09	92.14	98.91

During the second part of the trial, the various concentrations of the new formula were evaluated for oil removal from stainless steel coupons. According to the vendor, the greater the dilution ratio, the better the cleaning should be because at the lower dilution, the cleaning product can leave a film on the surface being cleaned. The results obtained in the lab did not show this trend. In fact the cleaning was the highest for the lowest dilution ratio, 1:6. At this ratio, an average contaminant removal of 100% was calculated, whereas the 1:36 average was only 93%. Table 3 lists the data from Part 2 of the evaluation.

Table 3. Multiple Dilution Ratio Cleaning Efficiencies

	1:06	1:12	1:20	1:28	1:36
Coupon 1	100.04	94.76	97.24	96.79	92.97
Coupon 2	100.11	96.47	97.12	96.46	94.68
Coupon 3	99.92	97.71	98.95	92.32	91.66
Average	100.02	96.31	97.77	95.19	93.10

Summary:

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

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Warren Chemical Company	Sea Wash 700 Old	8	99.79	☑	grease
Warren Chemical Company	Sea Wash 700 Old	8	99.99	☑	lubricant
Warren Chemical Company	Sea Wash 700 Old	8	98.95	☑	oil
Warren Chemical Company	Sea Wash 700 New	4	97.09	☑	grease
Warren Chemical Company	Sea Wash 700 New	4	92.14	☑	lubricant
Warren Chemical Company	Sea Wash 700 New	4	98.91	☑	oil

Conclusion:

Sea Wash 700 and 700N both were very effective in removing three common metal working fluids. In contrast to suggested claims, the old formulation, 700, out performed the newer version 700N. The 700N was also found to work better at the more concentrated (lower dilution ratio) level. This also was an unexpected result as expressed in product literature.