# CLEANING LABORATORY EVALUATION SUMMARY

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|---|---|
| SCL #: | 2002 |
| DateRun: | 07/31/2002 |
| Experimenters: | Jason Marshall |
| ClientType: | Metal |
| ProjectNumber: | Project #1 |
| Substrates: | Copper |
| PartType: | Coupon |
| Contaminants: | Buffing/Polishing Compounds, Greases |
| Cleaning Methods: | Ultrasonics |
| Analytical Methods: | Gravimetric |
| Purpose: | To evaluate successful cleaners under ultrasonic energy |
| Experimental Procedure: | The eight successful cleaners from the previous trial were again diluted to 5% using DI water in 600 ml beakers and heated to 130 F on a hot plate. Solutions were then degassed for 5 minutes in a Crest 40 kHz ultrasonic tank.<br>Twenty-four preweighed coupons were coated with coated with Jackson Lea Learok 7-S-3 Buffing compound (102-71-6, 14808-60-7, 1317-95-9). The buffing compound was applied by first heating it with a hot air gun and rubbing the coupons with the melted contaminant. Coupons were allowed to cool to room temperature and then weighed again. Three coupons were cleaned in each solution for 5 minutes using ultrasonic energy at 40 kHz. Following the cleaning, coupons were rinsed with a DI water bath for 30 seconds at room temperature and dried using a Master Appliance Heat Gun at 300 F for 15 seconds. Coupons were again allowed to cool to room temperature and then weighed a final time. Cleaning efficiencies were calculated and recorded. |
| Results: | Only two products, Permag S-4 and Micro 90 removed all of the buffing compound without any additional wiping action. However, it was noted that the buffing compound was again only loosely attached the coupons. When the coupons were wiped with a single pass using a paper towel, the remaining contaminant was removed easily. The following table lists the efficiencies calculated for both the initial Immersion test and the wipe analysis. |

| Cleaner | Initial wt of cont. | Final wt of cont. | %Cont Removed |
|---|---|---|---|
| Permag S-4 | 1.0714 | 0.0007 | 99.93 |
| | 1.7478 | 0.0006 | 99.97 |
| | 1.3386 | 0.0031 | 99.77 |
| 815 GD | 1.4520 | 0.6673 | 54.04 |
| | 1.3156 | 0.7116 | 45.91 |
| | 0.8519 | 0.4219 | 50.48 |
| Micro 90 | 1.2660 | -0.0006 | 100.05 |
| | 1.3342 | 0.0002 | 99.99 |
| | 1.0181 | 0.0000 | 100.00 |
| ND 17 | 1.4717 | 0.8485 | 42.35 |
| | 1.1798 | 1.2827 | -8.72 |
| | 1.3983 | 0.9215 | 34.10 |
| Inproclean 3800 | 1.1298 | 0.5082 | 55.02 |
| | 2.0867 | 1.4363 | 31.17 |
| | 0.8887 | 0.1345 | 84.87 |
| Dirtex | 1.2341 | 0.5514 | 55.32 |
| | 1.5249 | 1.0775 | 29.34 |
| | 1.1501 | 0.6131 | 46.69 |
| Polychem Spray 790P | 1.5179 | 1.7077 | -12.50 |
| | 2.3515 | 2.5264 | -7.44 |
| | 1.2234 | 1.3021 | -6.43 |
| Daraclean 282 GF | 0.9261 | 0.3788 | 59.10 |
| | 1.3303 | 0.7860 | 40.92 |
| | 0.9001 | 0.1792 | 80.09 |

Summary:

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| Substrates: | Copper |
|---|---|
| Contaminants: | Buffing/Polishing Compounds, Greases |

| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
|---|---|---|---|---|---|
| Magnuson Products | Permag S-4 | 5 | 99.89 | ☑ | no wipe |
| Brulin Corporation | Formula 815 GD | 5 | 99.94 | ☑ | wipe |
| International Products Corporation | Micro 90 Conc. | 5 | 100.01 | ☑ | no wipe |
| MacDermid Industrial Products | ND 17 | 5 | 99.74 | ☑ | with wipe |
| Oakite Products | Inproclean 3800 | 5 | 99.96 | ☑ | with wipe |
| Savogran Company | Dirtex Prepaint Cleaner | 5 | 99.80 | ☑ | with wipe |
| US Polychem Corporation | Polyspray Jet 790 P | 5 | 99.83 | ☑ | with wipe |
| Magnaflux | Daraclean 282 GF | 5 | 99.91 | ☑ | with wipe |

Conclusion: Two products were successful in removing the buffing compound with ultrasonics alone. Permag S-4 and Micro 90 will be compared directly under conditions similar to current cleaning setup of 1/2% solution and 1-2 minute cleaning time.