# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008

DateRun: 06/19/2008

Experimenters: Jason Marshall, Shweta Bansal

ClientType: Tool Manufacturer

ProjectNumber: Project #1

Substrates: Steel

PartType: Coupon

Contaminants: Lubricating/Lapping Oils

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate successful aqueous products on the fourth supplied soil.

Experimental Procedure: The top six products were selected from the previous lab trial. Each product was diluted to 5% using DI water in 600 ml glass beakers. Solutions were heated to 130 F on immersed in a heat bath in a Branson 40 kHz ultrasonic tank. Products were degassed for five minutes.

Eighteen preweighed steel coupons were coated with the Dow Corning G-n metal assembly spray lubricant by spraying the contaminant onto the surface. Coupons were weighed a second time to determine the amount of soil added. Three coupons were immersed into each product and cleaned for 5 minutes using ultrasonic agitation. Following cleaning, coupons were rinsed for 15 seconds in tap water at 120 F and dried using air blow off for 30 seconds at room temperature. Final weights were recorded, and efficiencies were calculated.

Results: Four products removed over 80% of the lubricant, one of which removed all of the contaminant. The Micro 90 product had efficiency over 100%. Upon review of the coupons, do visual damage was apparent and the excessive cleaning may have been due to the coupons not being completely cleaned prior to the baseline initial weights. Only one product was ineffective, removing just a third of the contaminant. The table lists the amount of lubricant added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|---|---|---|---|
| Micro 90 | 0.1011 | 0.0016 | 98.42 |
| | 0.0799 | -0.0060 | 107.51 |
| | 0.1403 | -0.0056 | 103.99 |
| Polyspray Jet 790 XS | 0.1608 | -0.0051 | 103.17 |
| | 0.1047 | 0.0037 | 96.47 |
| | 0.2180 | 0.1122 | 48.53 |
| Luminox | 0.2134 | 0.1242 | 41.80 |
| | 0.1216 | 0.1005 | 17.35 |
| | 0.0724 | 0.0428 | 40.88 |
| Daraclean 282GF | 0.0352 | 0.0009 | 97.44 |
| | 0.0294 | 0.0041 | 86.05 |
| | 0.0966 | 0.0143 | 85.20 |
| Metalnox M 6310 | 0.0809 | 0.0191 | 76.39 |
| | 0.0913 | 0.0193 | 78.86 |
| | 0.0850 | 0.0110 | 87.06 |
| Armakleen M Aero | 0.1055 | 0.0198 | 81.23 |
| | 0.0686 | 0.0104 | 84.84 |
| | 0.0893 | 0.0235 | 73.68 |

Summary:

| **Substrates:** | Steel | | | | |
|---|---|---|---|---|---|
| **Contaminants:** | Lubricating/Lapping Oils | | | | |
| **Company Name:** | **Product Name:** | **Conc.:** | **Efficiency:** | **Effective:** | **Observations:** |
| International Products Corporation | Micro 90 Conc. | 5 | 103.31 | ☑ | |
| US Polychem Corporation | Polyspray Jet 790 XS | 5 | 82.72 | ☑ | |
| Alconox Inc | Luminox | 5 | 33.35 | ☐ | |

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|---|---|---|---|---|---|
| Magnaflux | Daraclean 282 GF | 5 | 89.56 | ☑ | |
| Kyzen Corporation | Metalnox M6310 (For Comparison Only) | 5 | 80.77 | ☑ | |
| Church & Dwight Co Inc. | Armakleen M Aero | 5 | 79.92 | ☑ | |

Conclusion: Several of the products were found to remove most of the lubricant within the short cleaning time. Overall results for three of the soils yielded Mirco 90, Daraclean 282 GF, Polyspray Jet 790 xs and Armakleen M Aero as the top four products with averages above 90%. These products will be evaluated on supplied parts.