# CLEANING LABORATORY EVALUATION SUMMARY

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|---|---|
| SCL #: | 2023 |
| DateRun: | 08/21/2023 |
| Experimenters: | Alexander Symko, Amelia Wagner |
| ClientType: | Metal |
| ProjectNumber: | Project #1 |
| Substrates: | Copper, Stainless Steel |
| PartType: | Coupon |
| Contaminants: | Greases, Lubricating/Lapping Oils |
| Cleaning Methods: | Ultrasonics |
| Analytical Methods: | Wipe |
| Purpose: | To find an effective alternative to nPB in removing metal working fluid and grease from copper and stainless steel rings |
| Experimental Procedure: | Two cleaners were chosen to be tested, Cleaner 1. Waterworks Heavy Duty Degreaser 1:4 dilution (the highest vendor recommended dilution), and Cleaner 2. Surface Cleanse 930 10% concentration. Three types of substrates were supplied by the company, being copper rings, steel discs (female) and steel discs (male). Two soils were tested with each cleaner, Soil A. Moly Dee (the most difficult soil for the company to remove), and Soil B. Tap Magic EP-extra (the most used soil). Three coupons of each substrate were used for each soil, meaning a total of 18 coupons were used for each cleaner. The coupons were soiled by dabbing the soils on using a swab. The coupons were then subjected to 15 minutes of unheated ultrasonics in their respective cleaner. Once the coupons were removed, their cleanliness was determined with a white glove test. Each coupon was wiped with a white cotton glove. If any soil came off onto the glove the coupons were declared to still be soiled. If no soil came off onto the glove the coupons were declared clean. |

Results:

| Cleaner | Soil | Substrate | White Glove Test |
|---|---|---|---|
| Waterworks Heavy Duty Degreaser 1:4 | A | Copper | O |
| | | Copper | O |
| | | Copper | O |
| | | Steel (F) | O |
| | | Steel (F) | O |
| | | Steel (F) | O |
| | | Steel (M) | O |
| | | Steel (M) | O |
| | | Steel (M) | O |
| | B | Copper | O |
| | | Copper | O |
| | | Copper | O |
| | | Steel (F) | O |
| | | Steel (F) | O |
| | | Steel (F) | O |
| | | Steel (M) | O |
| | | Steel (M) | O |
| | | Steel (M) | O |
| Surface Cleanse 930 10% | A | Copper | O |
| | | Copper | O |
| | | Copper | O |
| | | Steel (F) | O |
| | | Steel (F) | O |
| | | Steel (F) | O |
| | | Steel (M) | O |
| | | Steel (M) | O |
| | | Steel (M) | O |
| | B | Copper | O |
| | | Copper | O |

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| | | | |
|---|---|---|---|
| | | Copper | O |
| | | Steel (F) | O |
| | | Steel (F) | O |
| | | Steel (F) | O |
| | | Steel (M) | O |
| | | Steel (M) | O |
| | | Steel (M) | O |

Unsure of whether or not the Surface Cleanse caused the copper to turn gray in certain spots, or if the copper was already like that.

Summary:

Conclusion: Both cleaners were effective in removing the soil from the coupons using unheated ultrasonics. They can both be tested at lower concentrations.