# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2024

DateRun: 02/26/2024

Experimenters: Tatyanna Moreland Junior

ClientType: Lab

ProjectNumber: Project #8

Substrates: Brass, Copper

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate the effectiveness of SB-2, SB-11, SB-22, and SB-23 in removing Honing Oil from copper and brass coupons as a potential replacement for TCE with an unheated ultrasonic cleaning method.

Experimental Procedure: Three copper and brass coupons were used for each cleaner being tested, for a total of 12 coupons per cleaner. The initial weights of each coupon were recorded. The bottom third of every coupon was soiled by applying the contaminate with a swab. The dirty weights of each coupon were then recorded. The coupons were then subjected to unheated ultrasonic in the cleaners for 15 minutes. After the coupons were cleaned, they were left to air-dry overnight. The next morning, the clean weights of each coupon were taken.

Results:

| Substrate | Cleaner | Coupon # | Initial weight of cont. | Final weight of cont. | %Cont Removed | Average % Removal |
|---|---|---|---|---|---|---|
| Copper | SB-2 | 21 | 0.0429 | 0.0566 | -31.93 | -276.87 |
| | | 25 | 0.0167 | 0.0632 | -278.44 | |
| | | 27 | 0.0168 | 0.1042 | -520.24 | |
| | SB-11 | 15 | 0.0658 | 0.0537 | 18.39 | -73.92 |
| | | 16 | 0.0271 | 0.0794 | -192.99 | |
| | | 39 | 0.0333 | 0.049 | -47.15 | |
| | SB-22 | 11 | 0.0688 | 0.0064 | 90.70 | 91.86 |
| | | 16 | 0.0275 | 0.0018 | 93.45 | |
| | | 17 | 0.0257 | 0.0022 | 91.44 | |
| | SB-23 | 2 | 0.0349 | 0.0041 | 88.25 | 89.90 |
| | | 29 | 0.0376 | 0.0048 | 87.23 | |
| | | 40 | 0.0536 | 0.0031 | 94.22 | |
| Brass | SB-2 | 2 | 0.0488 | 0.0481 | 1.43 | -36.45 |
| | | 5 | 0.0298 | 0.0369 | -23.83 | |
| | | 23 | 0.0284 | 0.0531 | -86.97 | |
| | SB-11 | 10 | 0.0463 | 0.0324 | 30.02 | 35.72 |
| | | 11 | 0.0274 | 0.0216 | 21.17 | |
| | | 17 | 0.0536 | 0.0236 | 55.97 | |
| | SB-22 | 9 | 0.0271 | 0.004 | 85.24 | 87.32 |
| | | 15 | 0.0565 | 0.0059 | 89.56 | |
| | | 34 | 0.0444 | 0.0057 | 87.16 | |
| | SB-23 | 14 | 0.0244 | 0.0013 | 94.67 | 78.95 |
| | | 18 | 0.0214 | 0.005 | 76.64 | |
| | | 25 | 0.0148 | 0.0051 | 65.54 | |

Summary:

Conclusion: SB-2 and SB-11 did not dry properly overnight, and in some cases, their final contents were higher than their initials. SB-22 and SB-23 seemed like effective alternatives. Further testing can be done to create the ideal range of cleaning time and contaminants added.