

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2024
 DateRun: 02/24/2024
 Experimenters: Tatyanna Moreland Junior
 ClientType: Lab
 ProjectNumber: Project #8
 Substrates: Brass, Copper
 PartType: Coupon
 Contaminants: Greases
 Cleaning Methods: Ultrasonics
 Analytical Methods: Gravimetric

Purpose: To evaluate the effectiveness of SB-2, SB-11, SB-22, SB-23, and SB-32 in removing Slide Gel No. 7 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 15 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 wt of cont. | Final wt of cont. | %Cont Removed | Average % Removal |
|----------|-----------|---------|----------|---------------------|-------------------|---------------|-------------------|
| | Copper | SB-2 | 2 | 0.0619 | 0.0714 | -15.35 | -74.60 |
| | | | 11 | 0.0269 | 0.0675 | -150.93 | |
| | | | 16 | 0.0386 | 0.0608 | -57.51 | |
| | | SB-11 | 16 | 0.0264 | 0.0312 | -18.18 | -12.06 |
| | | | 26 | 0.0314 | 0.0298 | 5.10 | |
| | | | 40 | 0.0290 | 0.0357 | -23.10 | |
| | | SB-22 | 7 | 0.0590 | 0.0124 | 78.98 | 82.10 |
| | | | 17 | 0.0348 | 0.0022 | 93.68 | |
| | | | 39 | 0.0531 | 0.0140 | 73.63 | |
| | | SB-23 | 5 | 0.0305 | 0.0018 | 94.10 | 97.69 |
| | | | 21 | 0.0529 | 0.0015 | 97.16 | |
| | | | 29 | 0.0390 | -0.0007 | 101.79 | |
| | | SB-32 | 4 | 0.0329 | 0.0163 | 50.46 | 73.11 |
| | | | 25 | 0.0276 | 0.0056 | 79.71 | |
| | | | 27 | 0.0406 | 0.0044 | 89.16 | |
| | Brass | SB-2 | 7 | 0.0384 | 0.0058 | 84.90 | 43.33 |
| | | | 14 | 0.027 | 0.0299 | -10.74 | |
| | | | 22 | 0.0326 | 0.0144 | 55.83 | |
| | | SB-11 | 11 | 0.0241 | 0.0175 | 27.39 | 26.07 |
| | | | 18 | 0.0432 | 0.0177 | 59.03 | |
| | | | 32 | 0.0305 | 0.033 | -8.20 | |
| | | SB-22 | 5 | 0.0355 | 0.0152 | 57.18 | 60.61 |
| | | | 26 | 0.0412 | 0.0168 | 59.22 | |
| | | | 31 | 0.035 | 0.0121 | 65.43 | |
| | | SB-23 | 2 | 0.0425 | 0.0105 | 75.29 | 86.13 |
| | | | 15 | 0.0309 | 0.0013 | 95.79 | |
| | | | 25 | 0.0244 | 0.0031 | 87.30 | |
| | | SB-32 | 6 | 0.0572 | 0.0173 | 69.76 | 63.89 |
| | | | 10 | 0.0533 | 0.0222 | 58.35 | |
| | | | 28 | 0.0343 | 0.0125 | 63.56 | |

Summary: **Substrates:** Brass, Copper

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|----------------------|----------------------|---------------|--------------------|-------------------------------------|----------------------|
| Contaminants: | Greases | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| TURI Cleaning lab | SB-2 | 100 | 59.00 | <input type="checkbox"/> | |
| TURI Cleaning lab | SB-11 | 100 | 7.00 | <input type="checkbox"/> | |
| TURI Cleaning lab | SB-22 | 100 | 71.00 | <input type="checkbox"/> | |
| TURI Cleaning lab | SB-23 | 100 | 92.00 | <input checked="" type="checkbox"/> | |
| TURI Cleaning lab | SB-32 | 100 | 68.00 | <input type="checkbox"/> | |

Conclusion:

SB-2 and SB-11 did not dry properly overnight, making their final contents higher than their initials. SB-22 and SB-23 seemed like effective alternatives, but due to the "overcleaning" causing negative percent removals, further testing could be done to create the ideal range of cleaning time and contaminants added. SB-32 turned light blue after testing, this was caused by the Ethyl Lactate stripping copper ions from the metal and the mixture will not be used in further testing.