

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2024  
 DateRun: 03/01/2024  
 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 a heated 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 heated ultrasonic at 140 degrees Fahrenheit 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    | 1        | 0.0479              | 0.0522            | -8.98         | -93.62            |
|           |         | 2        | 0.0198              | 0.0673            | -239.90       |                   |
|           |         | 3        | 0.0272              | 0.0359            | -31.99        |                   |
|           | SB-11   | 4        | 0.0345              | 0.0252            | 26.96         | -72.06            |
|           |         | 6        | 0.0177              | 0.0326            | -84.18        |                   |
|           |         | 7        | 0.0173              | 0.0448            | -158.96       |                   |
|           | SB-22   | 11       | 0.0244              | 0.0005            | 97.95         | 94.42             |
|           |         | 14       | 0.0153              | 0.0011            | 92.81         |                   |
|           |         | 16       | 0.0187              | 0.0014            | 92.51         |                   |
|           | SB-23   | 17       | 0.0433              | 0.0009            | 97.92         | 73.48             |
|           |         | 21       | 0.0324              | 0.0007            | 97.84         |                   |
|           |         | 31       | 0.0312              | 0.0235            | 24.68         |                   |
| Brass     | SB-2    | 4        | 0.0352              | 0.0046            | 86.93         | 85.23             |
|           |         | 7        | 0.0176              | 0.0022            | 87.50         |                   |
|           |         | 8        | 0.0224              | 0.0042            | 81.25         |                   |
|           | SB-11   | 12       | 0.0237              | 0.0218            | 8.02          | -61.28            |
|           |         | 14       | 0.0135              | 0.0214            | -58.52        |                   |
|           |         | 16       | 0.0129              | 0.0301            | -133.33       |                   |
|           | SB-22   | 18       | 0.0226              | -0.0024           | 110.62        | 108.01            |
|           |         | 22       | 0.0246              | -0.0033           | 113.41        |                   |
|           |         | 25       | 0.0305              | 0.0000            | 100.00        |                   |
|           | SB-23   | 26       | 0.0255              | -0.0036           | 114.12        | 106.73            |
|           |         | 28       | 0.0231              | -0.0010           | 104.33        |                   |
|           |         | 31       | 0.0515              | -0.0009           | 101.75        |                   |

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-2 seemed to be really effect on the brass coupons and testing should be replicated for consistency. SB-22 and SB-23 seemed like effective alternatives, but due to the "overcleaning" causing negative final weights, further testing can be done to determine the ideal range of cleaning time and contaminants added.