# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2024

DateRun: 07/24/2024

Experimenters: Tatyanna Moreland Junior

ClientType: Lab

ProjectNumber: Project #8

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Greases

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate the effectiveness of SB-27 (t-Butyl Acetate 70% (CAS No: 540-88-5) + Benzyl Alcohol 30% (CAS No: 100-51-6)) and SB-32 (Ethyl Lactate 81% (CAS No: 97-64-3) + Propylene Carbonate 19% (CAS No: 108-32-7)) in removing greases from stainless steel coupons as a potential replacement of TCE with a heated ultrasonic cleaning method.

Experimental Procedure: Three stainless steel coupons were used for each cleaner and soil combination, making a total of twelve coupons. The initial weights of each coupon were recorded. Around 0.1 g of each contaminant was added to the bottom third of the coupon with a swab, and the dirty weights of each coupon were then recorded. The coupons were then subjected to heated ultrasonics in the cleaner for 15 minutes at a temperature of 120 °F. After the coupons were cleaned, they were left to air dry over night, and clean weights of each coupon were taken the following day.

Results:

| Cleaner | Soil | Initial weight of cont. | Final weight of cont. | % Content Removed | Average % Removal |
|---|---|---|---|---|---|
| SB-27 | DAW 330B | 0.0761 | 0.0664 | 12.75 | -21.63 |
| | | 0.0420 | 0.0550 | -30.95 | |
| | | 0.0863 | 0.1266 | -46.70 | |
| | Slide Gel No. 7 | 0.0523 | 0.0106 | 79.73 | 62.48 |
| | | 0.0407 | 0.0102 | 74.94 | |
| | | 0.0476 | 0.0320 | 32.77 | |
| SB-32 | DAW 330B | 0.0188 | 0.0007 | 96.28 | 91.95 |
| | | 0.0254 | 0.0027 | 89.37 | |
| | | 0.0286 | 0.0028 | 90.21 | |
| | Slide Gel No. 7 | 0.0409 | 0.0087 | 78.73 | 83.02 |
| | | 0.0355 | 0.0066 | 81.41 | |
| | | 0.0334 | 0.0037 | 88.92 | |

Summary:

| **Substrates:** | Stainless Steel | | | | |
|---|---|---|---|---|---|
| **Contaminants:** | Greases | | | | |
| **Company Name:** | **Product Name:** | **Conc.:** | **Efficiency:** | **Effective:** | **Observations:** |
| TURI Cleaning lab | SB-27 | | 23.00 | ☐ | |
| TURI Cleaning lab | SB-32 | | 86.00 | ☑ | |

Conclusion: Overall, the cleaners were not effective in removing the contaminants, but the only one that worked well enough was SB-32 on DAW 330B. When taking the coupons out of the cleaner, thick clumps of soil clung together and slipped right off the coupons. For the coupons in SB-27, the soil clung together the same way, but it was still attached to the coupon when I took them out, and they even seemed to absorb some of the cleaner and make the averages negative.