

# 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.

| 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             |                   |

|                      |                      |                 |                    |                                     |                      |
|----------------------|----------------------|-----------------|--------------------|-------------------------------------|----------------------|
| <b>Substrates:</b>   |                      | Stainless Steel |                    |                                     |                      |
| <b>Contaminants:</b> |                      | Greases         |                    |                                     |                      |
| <b>Company Name:</b> | <b>Product Name:</b> | <b>Conc.:</b>   | <b>Efficiency:</b> | <b>Effective:</b>                   | <b>Observations:</b> |
| TURI Cleaning lab    | SB-27                |                 | 23.00              | <input type="checkbox"/>            |                      |
| TURI Cleaning lab    | SB-32                |                 | 86.00              | <input checked="" type="checkbox"/> |                      |

**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.