

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2023
 DateRun: 10/13/2023
 Experimenters: Tatyanna Moreland Junior
 ClientType: Lab
 ProjectNumber: Project #8
 Substrates: Stainless Steel
 PartType: Coupon
 Contaminants: Oil
 Cleaning Methods: Ultrasonics
 Analytical Methods: Gravimetric

Purpose: To evaluate the effectiveness of SB-24 (92% Ektapro EEP, 8% t-butyl acetate), SB-32 (81% Ethyl Lactate, 19% Propylene Carbonate) and SB-41 (79% Ektapro EEP, 14% ethyl lactate, 7% t-butyl acetate) in removing two production oils from stainless steel coupons as a potential replacement for TCE with an unheated ultrasonics cleaning method.

Experimental Procedure: Three stainless steel coupons were used for each cleaner and the two soils being tested, for a total of 18 coupons. The initial weights of each coupon were recorded. The bottom third of every coupon was soiled by applying the corresponding soil with a swab. The dirty weights of each coupon were then recorded. The coupons were then subjected to unheated ultrasonics in SB-24, SB-32, and the mixture for 15 minutes. After the coupons were cleaned, they were left to air dry over night. The next morning, the clean weights of each coupon were taken.

| Soil | Cleaner | Initial Content Weight | Final Content Weight | Percent Content Removed | Average Percent Removed |
|-----------|---------|------------------------|----------------------|-------------------------|-------------------------|
| CD Aero A | SB-24 | 0.0674 | 0.0053 | 92.14 | 90.22 |
| | | 0.0388 | 0.0041 | 89.43 | |
| | | 0.0403 | 0.0044 | 89.08 | |
| | SB-32 | 0.0813 | 0.0037 | 95.45 | 85.65 |
| | | 0.0454 | 0.0155 | 65.86 | |
| | | 0.0391 | 0.0017 | 95.65 | |
| | SB-41 | 0.0483 | 0.0012 | 97.52 | 96.30 |
| | | 0.0324 | 0.0023 | 92.90 | |
| | | 0.0657 | 0.0010 | 98.48 | |
| CD Aero C | SB-24 | 0.0202 | 0.0023 | 88.61 | 91.36 |
| | | 0.0303 | 0.0026 | 91.42 | |
| | | 0.0202 | 0.0012 | 94.06 | |
| | SB-32 | 0.0210 | -0.0014 | 106.67 | 106.74 |
| | | 0.0208 | -0.0024 | 111.54 | |
| | | 0.0444 | -0.0009 | 102.03 | |
| | SB-41 | 0.0506 | 0.0003 | 99.41 | 99.97 |
| | | 0.0329 | -0.0006 | 101.82 | |
| | | 0.0076 | 0.0001 | 98.69 | |

Summary:

| Substrates: | | Stainless Steel | | | |
|----------------------|---------------|--|-------------|-------------------------------------|-------------------|
| Contaminants: | | Oil | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| TURI Cleaning lab | SB-24 | 92% Ektapro EEP 8% t-butyl acetate | 96.00 | <input checked="" type="checkbox"/> | on CD Aero soil A |
| TURI Cleaning lab | SB-24 | 92% Ektapro EEP 8% t-butyl acetate | 91.00 | <input checked="" type="checkbox"/> | on CD Aero soil C |
| TURI Cleaning lab | SB-32 | Ethyl Lactate 81% (CAS No: 97-64-3) + Propylene Carbonate 19% (CAS No: 108-32-7) | 86.00 | <input checked="" type="checkbox"/> | on CD Aero soil A |

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|-------------------------|-------|--|--------|-------------------------------------|----------------------|
| TURI Cleaning lab | SB-32 | Ethyl Lactate 81% (CAS No: 97-64-3) + Propylene Carbonate 19% (CAS No: 108-32-7) | 107.00 | <input type="checkbox"/> | on CD Aero soil C |
| TURI Cleaning lab | SB-41 | Ektapro Ethyl 3-ethoxypropionate 79% (CAS No: 763-69-9) + t-Butyl Acetate 7% (CAS No: 540-88-5) + Ethyl lactate 14% (CAS No: 97-64-3) | 96.00 | <input checked="" type="checkbox"/> | on CD Aero Soil A |
| TURI Cleaning lab | SB-41 | Ektapro Ethyl 3-ethoxypropionate 79% (CAS No: 763-69-9) + t-Butyl Acetate 7% (CAS No: 540-88-5) + Ethyl lactate 14% (CAS No: 97-64-3) | 100.00 | <input checked="" type="checkbox"/> | on CD Aero soil C |

Conclusion:

The cleaners seemed to be effective at removing the soil but when left to air dry, the coupons that were cleaned in SB-32 and the mixture did not dry completely.