

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2023
 DateRun: 05/31/2023
 Experimenters: Amelia Wagner
 ClientType: Tool Manufacturer
 ProjectNumber: Project #2
 Substrates: Stainless Steel
 PartType: Coupon
 Contaminants: Greases, Oil
 Cleaning Methods: Ultrasonics
 Analytical Methods: Gravimetric
 Purpose: To test two solvents in cleaning oil and grease from stainless steel as an alternative to TCE using unheated ultrasonics.

Experimental Procedure: Two solvents were identified previously using the Hspip software; SB-33 (D-limonene 85% + Dimethyl glutarate 15%) and SB-31 (Benzyl alcohol 63% + Ethyl lactate 37%). Twelve stainless steel coupons were chosen and initial weights of each were recorded. Half of the coupons were soiled with Hocut 795 and half were soiled with RI-780. The soils were applied to the bottom third of each coupon using a swab. The coupons were then cleaned by their respective solvent using a method of unheated ultrasonics. The coupons were immersed and subjected to ultrasonics agitation for 15 minutes. The coupons were then removed and left to dry overnight. The next morning clean weights were recorded.

Results:

| Cleaner | Soil | Substrate | Initial wt of cont. | Final wt of cont. | %Cont Removed | % AVG | % Overall |
|---------|-----------|-----------------|---------------------|-------------------|---------------|-------|-----------|
| SB-33 | Hocut 795 | Stainless Steel | 0.0351 | 0.0098 | 72.08 | 87.75 | 84.25 |
| | | Stainless Steel | 0.1139 | 0.0062 | 94.56 | | |
| | | Stainless Steel | 0.2239 | 0.0076 | 96.61 | | |
| | RI 780 | Stainless Steel | 0.0405 | 0.0060 | 85.19 | 80.75 | |
| | | Stainless Steel | 0.0371 | 0.0072 | 80.59 | | |
| | | Stainless Steel | 0.0238 | 0.0056 | 76.47 | | |
| SB-31 | Hocut 795 | Stainless Steel | 0.1013 | 0.0677 | 33.17 | 52.37 | 61.64 |
| | | Stainless Steel | 0.3055 | 0.0712 | 76.69 | | |
| | | Stainless Steel | 0.1693 | 0.0893 | 47.25 | | |
| | RI 780 | Stainless Steel | 0.0399 | 0.0149 | 62.66 | 70.91 | |
| | | Stainless Steel | 0.0419 | 0.0173 | 58.71 | | |
| | | Stainless Steel | 0.0370 | 0.0032 | 91.35 | | |

The coupons associated with solvent SB-31 had pools of solvent remaining after being left to air dry overnight.

Summary:

Conclusion: SB-33 is an effective solvent in removing the soils from stainless steel coupons using unheated ultrasonics. SB-31 is not an effective solvent in removing the soils from stainless steel coupons using unheated ultrasonics. SB-31 may prove to be more effective with an added drying step after the cleaning application.