

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2023

DateRun: 05/25/2023

Experimenters: Amelia Wagner, Dylan Labonte

ClientType: Tool Manufacturer

ProjectNumber: Project #2

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Greases, Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To test two solvents in cleaning oil and grease from stainless steel as an alternative to TCE using heated immersion.

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 heated immersion. The coupons were immersed for 15 minutes with a stir bar set to 200 rpm at a temperature of 130 F. 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 | 0.0890 | 0.0017 | 98.09 | 96.85 | 92.84 |
| | | Stainless Steel | 0.0482 | 0.0037 | 92.32 | | |
| | | Stainless Steel | -0.4185 | 0.0006 | 100.14 | | |
| | RI 780 | Stainless Steel | 0.0282 | 0.0026 | 90.78 | 88.82 | |
| | | Stainless Steel | 0.0320 | 0.0061 | 80.94 | | |
| | | Stainless Steel | 0.0286 | 0.0015 | 94.76 | | |
| SB-31 | Hocut 795 | Stainless Steel | 0.1144 | 0.0151 | 86.80 | 84.73 | 86.06 |
| | | Stainless Steel | 0.1247 | 0.0194 | 84.44 | | |
| | | Stainless Steel | 0.0721 | 0.0123 | 82.94 | | |
| | RI 780 | Stainless Steel | 0.0403 | 0.0008 | 98.01 | 87.38 | |
| | | Stainless Steel | 0.0301 | 0.0091 | 69.77 | | |
| | | Stainless Steel | 0.0515 | 0.0029 | 94.37 | | |

The coupons associated with solvent SB31 were still partially wet after being left to air dry overnight.

Summary:

Conclusion: Both SB-33 and SB-31 are effective in removing oil and grease from stainless steel coupons using heated immersion. SB-31 may need a drying application after cleaning in order to be used in a company application.