

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1998
 DateRun: 04/06/1998
 Experimenters: Jason Marshall
 ClientType: Manufacturers of Precision Parts and Assemblies
 ProjectNumber: Project #2
 Substrates: Stainless Steel
 PartType: Coupon
 Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil
 Cleaning Methods: Ultrasonics
 Analytical Methods: Gravimetric, OSEE
 Purpose: Determine relationship between efficiency and OSEE

Experimental Procedure: Initial measurements of six coupons were made for OSEE and gravimetric analysis. The coupons were contaminated with the sulfur based oil supplied by the client. A second set of readings were made for the analytical methods. Coupons were cleaned using the two different baths (new and one week) of M-Auto from Church & Dwight. Cleaning took place in beakers place in a 40 kHz Crest Ultrasonic Unit for five minutes at 130 F. Coupons were rinsed in tap water at 120 F for thirty seconds and dried using air blow off and an Original Disc Furnace portable heater model 1500IV for one minute. After coupons cooled to room temperature, the final OSEE and gravimetric readings were made.

SUBSTRATE MATERIAL: Stainless Steel Coupons
 CONTAMINANTS: C-Eblis oil (sulfur based)

Results: Gravimetric analysis revealed the cleaning efficiencies to be 98% for the new bath and 87% for the used bath. OSEE readings are listed in Table 1.
 Table 1. OSEE Readings of Coupons

| Table 1. OSEE Readings of Coupons | | | |
|-----------------------------------|-----|-------|-------|
| New | | | |
| Coupon # | Pre | Dirty | Clean |
| 7 | 116 | 62 | 141 |
| 8 | 102 | 62 | 233 |
| 9 | 139 | 87 | 160 |
| Used | | | |
| Coupon # | Pre | Dirty | Clean |
| 10 | 104 | 85 | 117 |
| 11 | 181 | 96 | 132 |
| 12 | 128 | 85 | 127 |

When the coupons were contaminated with the oil, OSEE readings went down. After cleaning the values went back up again. The clean OSEE numbers from the New bath were higher than the Used bath. Also, the clean readings for both cleaners were greater than the initial values. This indicates that the coupons may not have been completely clean before the experiment was started.

Summary:

| | | | | | |
|-------------------------|----------------------|---|--------------------|-------------------------------------|----------------------|
| Substrates: | | Stainless Steel | | | |
| Contaminants: | | Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Church & Dwight Co Inc. | Armakleen M Auto | 3 | 98.00 | <input checked="" type="checkbox"/> | |

Conclusion: Gravimetric analysis was used to link OSEE readings to cleanliness levels. As can be seen in this trial, the more contaminant present on the substrate, the lower the OSEE numbers will be.