

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999
 DateRun: 12/15/1999
 Experimenters: Jason Marshall
 ClientType: Medical Instrument Mfr
 ProjectNumber: Project #1
 Substrates: Stainless Steel
 PartType: Coupon
 Contaminants: Greases, Lubricating/Lapping Oils
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric

Purpose: To further evaluate potential cleaners on other contaminants.

Experimental Procedure: Seven cleaning chemistries were selected based on the previous trial results. Five of these products were diluted to five percent and one to two percent by volume in 600 ml beakers using DI water. These six solutions were heated to 130 F on a hot plate. The seventh product was used at full strength at room temperature. Table 1 lists the products evaluated. Twenty-one preweighed stainless steel coupons were coated with the buffing compound and dried for 30 minutes at room temperature and weighed again. (Note: The six contaminants provided were sub-grouped according to their make up. There were three Aluminum Oxide based buffing compounds, two mineral oil based products and one other. Separate testing will be performed according to these classifications.)

Three coupons were cleaned for three minutes in a beaker using stir bar agitation. Coupons were rinsed in DI water at 130 F for 30 seconds and dried using a Master Appliance Corp, Hot-air gun model HG-301A at 500 F for one minute. After the coupons cooled to room temperature, a final clean weight was recorded and cleaning efficiencies were calculated.

SUBSTRATE MATERIAL: Stainless steel coupons (202-316 B-80)
 CONTAMINANTS: Snowden-Pencer F-26 Grease Stick Polishing Lubricant (CAS#: 64742-52-5, 68815-16-7, 67701-27-3, 102-71-6)
 CONTAMINATING PROCESS USED: Coupons covered with contaminant and air dried for 30 minutes.

Results: Cleaning efficiencies were much lower for this contaminant than in the previous trial. Two products, Safe Science and Texo Corp, were less than 70% effective in removing the mineral oil based contaminant. The remaining products removed between 70 and 85% of the contaminant with Oakite having the best cleaning efficiency. Table 2 lists the calculated cleaning efficiencies for all of the product tested.

Table 2. Cleaning Results

| Cleaner | Safe Science | Oakite | Texo Corp | US Polychem | Valtech | WR Grace | International |
|----------|--------------|--------|-----------|-------------|---------|----------|---------------|
| Coupon 1 | 44.92 | 88.13 | 76.97 | 73.66 | 75.39 | 61.71 | 68.62 |
| Coupon 2 | 59.70 | 79.02 | 67.25 | 68.66 | 69.80 | 74.10 | 79.75 |
| Coupon 3 | 45.17 | 80.05 | 58.82 | 91.68 | 85.50 | 84.04 | 85.61 |
| Average | 49.93 | 82.4 | 67.68 | 78.00 | 76.90 | 73.29 | 78.00 |

Summary:

| Substrates: | | Stainless Steel | | | | |
|------------------------------------|--|-----------------------------------|-------------|-------------------------------------|---------------|--|
| Contaminants: | | Greases, Lubricating/Lapping Oils | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: | |
| Safe Science Inc | Safe Science Engine Degreaser (Industrial) | 100 | 49.93 | <input type="checkbox"/> | | |
| Oakite Products | Inproclean 3800 | 5 | 82.40 | <input checked="" type="checkbox"/> | | |
| Texo Corporation | Texolite 1734 XL | 5 | 67.68 | <input type="checkbox"/> | | |
| US Polychem Corporation | Polychem A 2000 XS | 5 | 78.00 | <input checked="" type="checkbox"/> | | |
| Valtech Corporation | Valtron SP 2250 2LF | 5 | 76.90 | <input checked="" type="checkbox"/> | | |
| Magnaflux | Daraclean 282 GF | 5 | 73.29 | <input checked="" type="checkbox"/> | | |
| International Products Corporation | Micro 90 Conc. | 2 | 78.00 | <input checked="" type="checkbox"/> | | |

Conclusion:

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The five moderately successful products, Oakite, US Polychem, Valtech, WR Grace and International Products, will be used in the next trial using ultrasonic energy for cleaning the same contaminant.