

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999

DateRun: 06/23/1999

Experimenters: Jason Marshall

ClientType: Metal Working

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate six aqueous cleaner on second contaminant.

Experimental Procedure: Six cleaners from the previous trial were retested for removal of the second contaminant. Five of the six cleaners were diluted to 5% by volume in 400 mL Pyrex beakers and heated to 130 F on a hot plate. The six cleaner was made into 7.7% mixture and only heated to 105 F as recommended by the vendor. Eighteen preweighed coupons were contaminated with vanishing film and weighed again. Three coupons were cleaned in each beaker and cleaned using stir-bar-agitation for five minutes. Coupons were rinsed in 120 F tap water for 30 seconds and dried using a Master Appliance Corp, Hot-air gun model HG-301A for one minute at 500 F. After cooling to room temperature, final weights were recorded and cleaning efficiencies were calculated.

SUBSTRATE MATERIAL: Aluminum Coupons (5052)

CONTAMINANTS: Lubricant Mix-Hydroil AW-3 9petroleum hydrocarbon); Express Gear Lubricant F

CONTAMINATING PROCESS USED: Coupons were coated using a hand held swab.

Results: Half of the cleaners were less efficient in the removal of the machine lubricant mix. The other cleaning products removed over 95% of the contaminant. Oakite and Calgon were the two most effective cleaners tested. Table 2 lists the calculated cleaning efficiencies for all the products evaluated.

Table 2. Cleaning Efficiencies

| Cleaner | ForBest | Gemtek | US Polychem | Calgon | WR Grace | Oakite |
|----------|---------|--------|----------------|--------|-------------|--------|
| Coupon 1 | 96.85 | 63.97 | 99.26 | 96.04 | 96.88 | 98.6 |
| Coupon 2 | 90.6 | 70.38 | 93.17 | 99.77 | 64.58 | 99.58 |
| Coupon 3 | 80.05 | 70.36 | 94.97 | 100 | 61.42 | 99.25 |
| Average | 89.16 | 68.24 | 95.8 | 98.6 | 74.29 | 99.14 |

Summary:

| | | | | | | |
|-------------------------|---|---|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | | Aluminum | | | | |
| Contaminants: | | Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil | | | | |
| Company Name: | Product Name: | | Conc.: | Efficiency: | Effective: | Observations: |
| Oakite Products | Inproclean 3800 | | 5 | 99.14 | <input checked="" type="checkbox"/> | |
| US Polychem Corporation | Polyspray Jet 790 XS | | 5 | 95.80 | <input checked="" type="checkbox"/> | |
| Magnaflux | Daraclean 232 | | 5 | 74.29 | <input type="checkbox"/> | |
| Calgon Corporation | SMS 206 K | | 5 | 98.60 | <input checked="" type="checkbox"/> | |
| Gemtek Products | SC Aircraft & Metal Cleaner Super Concentrate | | 5 | 68.24 | <input type="checkbox"/> | |
| Warren Chemical Company | Sea Wash 700 Old | | 5 | 89.16 | <input type="checkbox"/> | |

Conclusion: Three of the six cleaners were effective in removing most of the contaminant from the coupons. These products, US Polychem Polyspray 790 XS, Calgon SMS 206 K, and Oakite Inproclean 3800 will be evaluated for removal of the final contaminant. In addition to this test, the current two cleaners will also be evaluated for the three contaminants.