

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999
 DateRun: 06/22/1999
 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 possible aqueous cleaner to be used in ultrasonic cleaning of aluminum parts.

Experimental Procedure: Six cleaners were selected based on vendor supplied information and from the lab's Effective Tests Conditions Database. 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. Table 1 lists the cleaners selected and the dilutions used.

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: Tuf Draw Vanishing Film 2889 (CAS #: 64741-65-7)

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

Results: All of the cleaners selected removed over 98% of the contaminant from the aluminum coupons. The highest efficiency was the Oakite Inproclean 3800 at 99.74%. Table 2 lists the effectiveness of the six cleaners tested.

| Table 2. Cleaning Efficiencies | | | | | | |
|--------------------------------|---------|--------|----------------|--------|-------------|--------|
| Cleaner | ForBest | Gemtek | US Polychem | Calgon | WR Grace | Oakite |
| Coupon 1 | 98.99 | 99.18 | 99.36 | 99.58 | 99.58 | 99.62 |
| Coupon 2 | 99.89 | 98.58 | 99.18 | 100 | 99.76 | 99.72 |
| Coupon 3 | 99.20 | 98.56 | 99.77 | 99.17 | 97.8 | 99.89 |
| Average | 99.36 | 98.77 | 99.44 | 99.58 | 99.05 | 99.74 |

Summary:

| | | | | | | |
|-------------------------|---|---|--------------------|-------------------------------------|----------------------|--|
| Substrates: | | Aluminum | | | | |
| Contaminants: | | Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: | |
| Warren Chemical Company | Sea Wash 700 Old | 5 | 99.36 | <input checked="" type="checkbox"/> | | |
| US Polychem Corporation | Polyspray Jet 790 XS | 5 | 99.44 | <input checked="" type="checkbox"/> | | |
| Magnaflux | Daraclean 232 | 5 | 99.05 | <input checked="" type="checkbox"/> | | |
| Calgon Corporation | SMS 206 K | 5 | 99.58 | <input checked="" type="checkbox"/> | | |
| Oakite Products | Inproclean 3800 | 5 | 99.74 | <input checked="" type="checkbox"/> | | |
| Gemtek Products | SC Aircraft & Metal Cleaner Super Concentrate | 5 | 98.77 | <input checked="" type="checkbox"/> | | |

Conclusion: All six cleaners will be evaluated using the other process contaminant currently involved with manufacturing process.