

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2000
 DateRun: 03/21/2000
 Experimenters: Jason Marshall, Nicole Vayo
 ClientType: City Government
 ProjectNumber: Project #1
 Substrates: Aluminum, Brass, Ceramics, Stainless Steel
 PartType: Coupon
 Contaminants: Cutting/Tapping Fluids, Greases, Inks, Lubricating/Lapping Oils, Oil
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric
 Purpose: To evaluate two supplied cleaning products for removal of listed contaminants

Experimental Procedure: One product was used directly from the bottle and the second was diluted to 5% using DI water in 600 ml beakers. Both solutions were evaluated at room temperature for five minutes of soaking. Three coupons per contaminant were cleaned and then rinsed for 30 seconds at room temperature. Coupons were dried for two hours at room temperature. Gravimetric analysis was performed to determine percent removal of the contaminants.

SUBSTRATE MATERIAL: Aluminum 202-2024 T-3, Brass, Stainless Steel 202-174-68-HR, Ceramic Coupons
 CONTAMINANTS: The contaminants used are listed in Table 1.

Table 1. Contaminants

| Class | Name | CAS # |
|--------|--------------|--|
| OIL | Citgo NC 400 | 64741-89-5, 8052-42-4 |
| INK | Steel Blue | 67-63-0, 108-88-3, 9004-70-0 , 109-60-4, 141-78-6, 64-17-5 |
| GREASE | KSL-111 | 64742-47-8, 8052-42-4 |
| LUB | Keystone423 | 64742-57-0, 64742-62-7 |

Results: One product was used directly from the bottle and the second was diluted to 5% using DI water in 600 ml beakers. Both solutions were evaluated at room temperature for five minutes of soaking. Three coupons per contaminant were cleaned and then rinsed for 30 seconds at room temperature. Coupons were dried for two hours at room temperature. Gravimetric analysis was performed to determine percent removal of the contaminants.

Table 3. Cleaning Effectiveness

| Product | | | | | | | | |
|----------|---------------------------|--------|--------|-------------------------|-------|--------|--------|--------|
| | Drummand American Keynote | | | Drummand American Clout | | | | |
| Cont/Sub | AL-LUB | CE-OIL | SS-INK | AL-GR | AL-GR | CE-OIL | BR-INK | SS-LUB |
| Coupon 1 | 99.26 | 99.33 | 0.07 | 99.67 | 98.9 | 99.61 | 8.81 | 96.71 |
| Coupon 2 | 99.21 | 99.53 | 16.8 | 99.95 | 98.86 | 99.86 | 7.32 | 95.24 |
| Coupon 3 | 99.58 | 99.79 | 5.34 | 99.79 | 98.87 | 99.5 | 9.73 | 97.65 |
| Average | 99.35 | 99.55 | 7.4 | 99.8 | 98.88 | 99.66 | 8.62 | 96.53 |

Summary:

| Substrates: | | Aluminum, Brass, Ceramics, Stainless Steel | | | | |
|------------------------------|--|--|--------|-------------|-------------------------------------|---------------|
| Contaminants: | | Cutting/Tapping Fluids, Greases, Inks, Lubricating/Lapping Oils, Oil | | | | |
| Company Name: | | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Drummond America Corporation | | Keynote | 100 | 99.35 | <input checked="" type="checkbox"/> | lubricant |
| Drummond America Corporation | | Keynote | 100 | 99.55 | <input checked="" type="checkbox"/> | oil |
| Drummond America Corporation | | Keynote | 100 | 7.40 | <input type="checkbox"/> | ink |
| Drummond America Corporation | | Keynote | 100 | 99.80 | <input checked="" type="checkbox"/> | |
| Drummond America Corporation | | Clout | 5 | 98.88 | <input checked="" type="checkbox"/> | grease |
| Drummond America Corporation | | Clout | 5 | 99.66 | <input checked="" type="checkbox"/> | oil |
| Drummond America Corporation | | Clout | 5 | 8.62 | <input type="checkbox"/> | ink |
| Drummond America Corporation | | Clout | 5 | 96.53 | <input checked="" type="checkbox"/> | lubricant |

Conclusion:

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Both Keynote and Clout had excellent removal of the oil, lubricant and grease but had equal difficulty in cleaning the ink.