

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2020

DateRun: 07/16/2020

Experimenters: Alicia McCarthy, Hayley Byra

ClientType: Metal Working

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Buffing/Polishing Compounds

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric, Visual

Purpose: The purpose of this experiment was to evaluate the effects of cleaners using unheated, heated, and heated immersion with agitation to remove the white buffing compound from aluminum substrates.

Experimental Procedure: The following cleaners were tested under specified conditions: Metalnox 6386 (100% concentration, 100°F), Liquinox (1% concentration, 170°F with a stir bar), Propylene carbonate (100% concentration, room temperature), SC Supersolve (5% concentration, room temperature), Dimethyl glutarate (100% concentration, 130°F). Three aluminum coupons were obtained and weighed for each of the five cleaners tested. Coupons were then soiled with the white buffing compound using a swab and a soiled weight was recorded. Coupons were then immersed into their respective cleaners under the listed conditions for five minutes. When five minutes passed, coupons were air dried, and a clean weight was obtained. Effectiveness of the cleaners was then determined.

| Cleaner | Initial wt. of cont. | Final wt. of cont. | % Cont. Removed | %AVG |
|---------------------|----------------------|--------------------|-----------------|-------|
| Metalnox 6386 | 0.0064 | 0.0034 | 46.88 | 32.11 |
| | 0.0138 | 0.011 | 20.29 | |
| | 0.0199 | 0.0141 | 29.15 | |
| Liquinox | 0.0052 | 0.0014 | 73.08 | 99.99 |
| | 0.0022 | -0.0004 | 118.18 | |
| | 0.0023 | -0.0002 | 108.7 | |
| Propylene Carbonate | 0.0206 | 0.0189 | 8.25 | 16.4 |
| | 0.0237 | 0.0217 | 8.44 | |
| | 0.0163 | 0.011 | 32.51 | |
| SC Supersolve | 0.0047 | 0.0032 | 31.91 | 15.35 |
| | 0.0052 | 0.0047 | 9.61 | |
| | 0.0044 | 0.0042 | 4.54 | |
| Dimethyl glutarate | 0.0031 | 0.0005 | 83.87 | 92.17 |
| | 0.0058 | 0.0002 | 96.55 | |
| | 0.0051 | 0.0002 | 96.08 | |

| Substrates: | | Aluminum | | | | |
|----------------------|---|-----------------------------|-------------|-------------------------------------|---------------|--|
| Contaminants: | | Buffing/Polishing Compounds | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: | |
| Kyzen Corporation | Metalnox M6386 | 100% | 32.11 | <input type="checkbox"/> | | |
| Alconox Inc | Liquinox | 1% | 99.99 | <input checked="" type="checkbox"/> | | |
| Fisher Scientific | Propylene carbonate 99.5% (CAS: 108-32-7) | 100% | 16.40 | <input type="checkbox"/> | | |
| Gemtek Products | SC Supersolve Safety Solvent | 5% | 15.35 | <input type="checkbox"/> | | |
| Fisher Scientific | Dimethyl glutarate (CAS:1119-40-0) | 100% | 92.17 | <input checked="" type="checkbox"/> | | |

Conclusion: Liquinox was the most effective cleaner removing an average of 99.99% of white buffing compound from aluminum substrates using a 1% concentration solution at 170°F with agitation from a stir bar. Note that some coupons exceeded 100% removal using Liquinox, this means excess soil present from previous experiments was also removed. Dimethyl glutarate was the second most effective removing an average of 92.17% using a 100% concentration solution at 130°F.