

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2020

DateRun: 07/23/2020

Experimenters: Alicia McCarthy, Hayley Byra

ClientType: Aircraft Parts Manufacturer

ProjectNumber: Project #1

Substrates: Glass/Quartz

PartType: Coupon

Contaminants: Resins/Rosins

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric, Visual

Purpose: The purpose of this experiment was to evaluate the effectiveness of cleaners to remove Rosin 2 (Pitch) and Protectocoat from glass substrates using heated ultrasonics.

Experimental Procedure: Two glass coupons were obtained for each of the cleaners tested. Cleaners were prepared at the following concentrations and temperatures: Smart Solve 605, RB Degreaser, SC Actisolv, Propylene carbonate, Dimethyl glutarate, SC Maxisolv, and Mirachem 500. An additional test was added to test unheated immersion with Mirachem 500 as a baseline comparison for the product. One coupon was soiled with the Rosin 2 (Pitch) and the other with Protectocoat by using a swab to coat the bottom third of the coupon, and soiled weights were obtained. Coupons were submerged into their respective heated cleaners using ultrasonics for 30 minutes. After 30 minutes passed, coupons were removed and allowed to air dry. Once dry a clean weight was obtained. Effectiveness of cleaners was then determined.

| Cleaner | Contaminant | Initial wt. of cont. | Final wt. of cont. | % Cont. Removed | %AVG |
|---------------------|----------------|----------------------|--------------------|-----------------|-------|
| Smart Solve 605 | Rosin 2 Pitch | 0.4488 | 0.0213 | 95.25 | 54.77 |
| | Protect-o-coat | 0.0098 | 0.0084 | 14.29 | |
| RB Degreaser | Rosin 2 Pitch | 0.3641 | 0.0012 | 99.67 | 50.85 |
| | Protect-o-coat | 0.0196 | 0.0192 | 2.04 | |
| SC Actisolv | Rosin 2 Pitch | 0.3311 | 0.0032 | 99.03 | 90.53 |
| | Protect-o-coat | 0.0284 | 0.0051 | 82.04 | |
| Propylene carbonate | Rosin 2 Pitch | 0.4045 | 0.0438 | 89.17 | 34.2 |
| | Protect-o-coat | 0.0207 | 0.025 | -20.78 | |
| Dimethyl glutarate | Rosin 2 Pitch | 0.4245 | 0.0016 | 99.62 | 96.8 |
| | Protect-o-coat | 0.0133 | 0.0008 | 93.98 | |
| SC Maxisolv | Rosin 2 Pitch | 0.4252 | 0.0007 | 99.84 | 97.2 |
| | Protect-o-coat | 0.0184 | 0.001 | 94.56 | |
| Mirachem 500 | Rosin 2 Pitch | 0.525 | 0.0142 | 97.3 | 95.89 |
| | Protect-o-coat | 0.0181 | 0.001 | 94.48 | |
| Mirachem 500* | Rosin 2 Pitch | 0.3652 | 0.3662 | -0.27 | 1.56 |
| | Protect-o-coat | 0.0148 | 0.0143 | 3.38 | |

*Unheated Immersion

Summary:

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| Substrates: | Glass/Quartz |
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CLEANING LABORATORY EVALUATION SUMMARY

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|-----------------------------------|------------------------------------------|---------------|--------------------|-------------------------------------|----------------------------------------------|
| Contaminants: | Resins/Rosins | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| United Laboratories International | Smart Solve 605 | 100% | 54.77 | <input type="checkbox"/> | Still oily/wet 24 hours later |
| Environmental Technology | RB Degreaser Cleaner | 20% | 50.85 | <input type="checkbox"/> | Did not work on protect-o-coat. |
| Gemtek Products | SC Actisolv Safety Solvent | 50% | 90.53 | <input checked="" type="checkbox"/> | |
| Fisher Scientific | Propylene carbonate 99.5% (CAS:108-32-7) | 100% | 34.20 | <input type="checkbox"/> | Did not work on protect-o-coat. |
| Fisher Scientific | Dimethyl glutarate (CAS:1119-40-0) | 100% | 96.80 | <input checked="" type="checkbox"/> | |
| Gemtek Products | Safe Care (SC) Maxi Solv | 100% | 97.20 | <input checked="" type="checkbox"/> | |
| Mirachem Corporation | Mirachem 500 | 25% | 95.89 | <input checked="" type="checkbox"/> | |
| Mirachem Corporation | Mirachem 500 | 25% | 1.56 | <input type="checkbox"/> | Did not work unheated & without ultrasonics. |

Conclusion:

SC Maxisolv 100% at 120°F using ultrasonics was the most effective at removing both soils from glass coupons removing an average of 97.20%. Dimethyl glutarate was the second most effective removing an average of 96.80%, Mirachem 500 the third most removing an average of 95.89%, and SC Actisolv the fourth most removing an average of 90.53%. Next step will be to test on parts.