

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2017

DateRun: 11/20/2017

Experimenters: Carla De La Cruz

ClientType: General

ProjectNumber: Project #1

Substrates: Brass, Nickel

PartType: Coupon

Contaminants: Lubricating/Lapping Oils, Dirt, Fingerprints, Fibers

Cleaning Methods: Immersion/Soak

Analytical Methods: Microphotography

Purpose: To evaluate the effectiveness of cleaners removal of lubricating oils and dirt from jeweled orifices.

Experimental Procedure: Brass and nickel jeweled orifices provided by Bird Precision were organized in sets of three for each product. Jeweled orifices were found to be the hardest substrate to clean based on expert judgement. Observations were taken using a microscope, and photographs were taken through the eyehole of the microscope. Visual observations were taken to note the initial, dirty, and clean appearance of the parts. Five drops of a lubricating oil provided by Bird Precision were applied to the orifices along with any contamination from dust, fibers, and skin oils. Parts were placed in a basket and cleaned for one minute using unheated immersion. Slight agitation was applied by shaking the basket in the solution before being removed and placed under a heated dryer for five minutes.

Results: Visual Observations

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| Sky Kleen 1000 |
| Initial |
| Brass: One part has small crack at the bottom of the jewel opening. |
| Nickel: No visible damage or dirt on the orifice or jewel. |
| Dirty |
| Brass: Oil obstructs jewel. |
| Nickel: Oil is not easily very visible on parts. |
| Clean |
| Brass: Parts slightly duller; some debris inside orifice; some small amount of residue on outside. |
| Nickel: No debris on part; not easy to rate cleanliness. |
| Wipe Off 5 |
| Initial |
| Brass: One part with a crack across the very top of the jewel. |
| Nickel: No visible damage or dirt on the orifice or jewel. |
| Dirty |
| Brass: Oil obstructs jewel. |
| Nickel: Oil obstructs jewel. |
| Clean |
| Brass: Parts discolored; no longer appear to be brass; some debris around orifice. |
| Nickel: Part appears to have lots of residue; oil burnt on. |
| Micro 90 |
| Initial |
| Brass: Slight scratch on the outer surface of one part. |

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| Nickel: No visible damage or dirt on the orifice or jewel. |
| Dirty |
| Brass: Oil visible on the inside of the jewel. |
| Nickel: Oil visible on the inside of the jewel. |
| Clean |
| Brass: Discolored parts; lots of debris and blockage of orifice. |
| Nickel: Parts appear damaged by heat; slightly burned; residue visible. |
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| BioCircle Aero |
| Initial |
| Brass: No visible damage or dirt on the orifice or jewel. |
| Nickel: No visible damage or dirt on the orifice or jewel. |
| Dirty |
| Brass: Oil visible on the inside of the jewel. |
| Nickel: Oil visible on the inside of the jewel. |
| Clean |
| Brass: Parts appear less bright; some residue on and around jewels and parts. |
| Nickel: Appear clean outside and inside. |
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| SC Aircraft & Metal Cleaner |
| Initial |
| Brass: No visible damage or dirt on the orifice or jewel. |
| Nickel: No visible damage or dirt on the orifice or jewel. |
| Dirty |
| Brass: Oil visible on the inside of the jewel. |
| Nickel: Oil visible on the inside of the jewel. |
| Clean |
| Brass: Some residue on inside of jewel; some debris; burned on oil in crevices. |
| Nickel: Residue on inside and outside of part. |

Summary:

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|------------------------------------|--|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Brass, Nickel | | | | |
| Contaminants: | Lubricating/Lapping Oils, Dirt, Fingerprints, Fibers | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Solutia | Sky Kleen 1000 (Aviation Solvent) | 100 | | <input checked="" type="checkbox"/> | |
| Chemco | Wipe Off 5 | 100 | | <input type="checkbox"/> | |
| International Products Corporation | Micro 90 Conc. | 100 | | <input type="checkbox"/> | |
| J Walter Inc. | Bio Circle Aero | 100 | | <input checked="" type="checkbox"/> | |
| Gemtek Products | SC Aircraft & Metal Cleaner Super Concentrate | 100 | | <input checked="" type="checkbox"/> | |

Conclusion:

Sky Kleen 1000 and Bio-circle Aero were effective at removing lubricating oil from brass and nickel jeweled orifices. Micro 90 and Wipe Off 5 damaged the parts and will no longer be used. Next step is to repeat this procedure using Gemtek aqueous cleaners.