

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 02/25/2021

Experimenters: Zoe Lawson, Justin Kiander

ClientType: Precision Instrument Manufacturer

ProjectNumber: Project #1

Substrates: Copper

PartType: Part

Contaminants: Oil

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric, Visual

Purpose: The purpose of this experiment was to determine the effectiveness of cleaners in removing penetrant oil from copper substrate parts provided by the company.

Experimental Procedure: Cleaners were prepared to the following concentrations: Metalnox 6386 100%, Water Works Heavy Duty Degreaser 7:1. Solutions and an ultrasonic bath were heated to 100°F. Three BeCu parts provided by the company were obtained and weighed. Parts were then soiled with the penetrant oil spray and a dirty weight was recorded. Once solutions reached the proper temperature, parts were submerged into their respective cleaners and ultrasonic cleaning was conducted for 15 minutes. After 15 minutes, parts were dried with a heat gun at ambient setting to remove all solution. Following the drying process, parts were weighed again and a clean weight was recorded. Effectiveness of the cleaners was then determined.

| Cleaner | Initial wt of cont | Final wt of cont | %Cont Removed | %AVG |
|---------------|--------------------|------------------|---------------|--------|
| Metalnox 6386 | 0.0827 | 0.0018 | 97.82 | 98.37% |
| | 0.1397 | 0.0028 | 98.00 | |
| | 0.1391 | 0.0010 | 99.28 | |
| Water Works | 0.1204 | 0.0011 | 99.09 | 99.17% |
| | 0.1714 | 0.0014 | 99.18 | |
| | 0.1849 | 0.0014 | 99.24 | |

Both cleaners were successful at removing the penetrant oil spray from BeCu substrates. Solutions did not experience as noticeable of a color change as in the penetrant oil trial with steel parts. However, all oil was visibly removed following the cleaning process. Next steps would be to test the effectiveness of cleaners removing aviation grease from the BeCu substrates.

| | | | | | | |
|----------|--|---------------------------|----------------------------------|---------------|--------------------|-------------------------------------|
| Summary: | | Substrates: Copper | | | | |
| | | Contaminants: Oil | | | | |
| | | Company Name: | Product Name: | Conc.: | Efficiency: | Effective: |
| | | Kyzen Corporation | Metalnox M6386 | 100% | 98.37 | <input checked="" type="checkbox"/> |
| | | Keteca USA | Water Works Heavy Duty Degreaser | 7:1 | 99.17 | <input checked="" type="checkbox"/> |

Conclusion: Upon completion of testing, it was determined that both cleaners were very effective at removing the penetrant oil spray from BeCu substrates. Next steps would be to test the effectiveness of the cleaners in removing aviation grease from BeCu substrates.