CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2022

DateRun: 02/17/2022

Experimenters: Nicole Kebler

ClientType: General

ProjectNumber: Project #2

Substrates: Copper

PartType: Part

Contaminants: Oil

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric, Visual

Purpose: To evaluate the removal of oil from copper tubes.

Experimental Procedure: One copper tube was used for each cleaner. The ultrasonics tank and the cleaners were heated prior to testing. Shopmaster, Mriachem 500, and SC-Aircraft were heated to 140 F and Water Works was heated to 105 F. The copper tubes were weighed for initial weights and then soiled with the Oak 15C oil by dipping them in the oil and hanging the tubes to remove excess oil. Once the excess oil was removed, the tubes were weighed for dirty weights. The tubes were then put, into their designated cleaner and tested for 15 minutes in the ultrasonics tank. They were allowed to dry overnight and then weighed for clean weights.

Once it was determined which cleaners removed the Oak 15C oil, the tubes were then tested using the same method with the Oak 15A-1 oil.

Results: All cleaners removed the Oak 15C oil at a 99% or higher effectiveness. They were all tested for the removal of 15A-1. Visually all tubes were clean after the second test, but gravimetrically Mirachem 500 and Water Works out performed Shopmaster and SC-Aircraft. Shopmaster also changed the coloring of the copper tubing and may not be compatible.

1. Results from the Oak 15C test

Cleaner	Initial wt. of cont.	Final wt. of cont.	Average
Shopmaster	0.2080	0.0006	99.71
Mirachem 500	0.1435	0.0013	99.09
Water Works	0.1361	0.0008	99.41
SC-Aircraft	0.2407	0.0001	99.96

2. Results from the Oak 15A-1 test

Cleaner	Initial wt. of cont.	Final wt. of cont.	Average
Shopmaster	0.1004	0.0247	75.40
Mirachem 500	0.1086	-0.0007	100.64
Water Works	0.1489	0.0006	99.60
SC-Aircraft	0.0778	0.0266	65.81

Summary:

Substrates:	Copper
Contaminants:	Oil

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Buckeye International	Shopmaster	20%	75.00	☐	Shopmaster changed the color of the copper tubing.
Mirachem Corporation	Mirachem 500	33%	100.00	☑	Mirachem 500 was effective for the removal of oil from copper tubing.
Keteca USA	Water Works Heavy Duty Degreaser	33%	99.00	☑	Water Works was effective for the removal of oil from copper tubing.
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	25%	66.00	☑	Visually SC-Aircraft was effective for the removal of oil from copper tubing.

Conclusion:

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Next steps are to continue testing with Mirachem 500 and Water Works and keep SC-Aircraft ready to test again. Also to start testing on additional oils and substrates provided by the company.