CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2017

DateRun: 05/05/2017

Experimenters: George Liang, Vinh Tran

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Copper

PartType: Coupon

Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric

Purpose: To evaluate the efficiency of supplied cleaner (Quicksolv DMC) and a comparative solvent (acetone) in the removal of Nisseki SAS-60E and Cut20 oils from copper coupons.

Experimental Procedure:

Soiling Process:

A set of twelve copper coupons were weighed on an analytical balance to determine their initial mass. Once this was completed half of the coupons were evenly soiled with about 0.5 gram of Nisseki SAS-60E oil, and the other half with about 0.5 gram of Cut20 oil using a handheld swab. The coupons were reweighed to determine the mass of the coupons with the contaminant applied.

Cleaning Process:

Three coupons that were soiled with Nisseki SAS-60E oil were placed on a Gardner Straight Line Washability unit. A Kimberly-Clark Wypal reinforced paper towel was attached to the cleaning sled and soaked with one spray of Quicksolv DMC. Each coupon was sprayed once with the same cleaning solution. The cleaning unit was run for 20 cycles (~33 seconds). This same process was run on another set of three copper coupons soiled with Cut20 oil. The remaining six coupons were run through the same process but cleaned with acetone. The coupons were allowed to dry for an hour before being weighed. Final weights were recorded, efficiencies were calculated and recorded.

Chemistries Evaluated: Quicksolv DMC, Acetone

Results: The sample cleaner Quicksolv DMC was just as effective as the acetone in removing the oils from the copper substrate. Both the Quicksolv DMC and the acetone had very high soil removal rates (97.11 – 98.84%, average 97.98% for Quicksolv DMC; 97.56 – 97.68%, average 97.62% for acetone).

Cleaner	Soil	Initial wt. of Cont. (g)	Final wt. of Cont. (g)	Cont. Removed (%)	Avg. Cont. Removed (%)	Avg. Removal Efficacy (%)
Quicksolv DMC	Nisseki SAS-60E	0.481	0.003	99.38	98.84	97.98
		0.4868	0.0057	98.83		
		0.4906	0.0082	98.33		
	Cut20	0.482	0.0124	97.43	97.11	
		0.5114	0.0136	97.34		
		0.6485	0.0223	96.56		
Acetone	Nisseki SAS-60E	0.3509	0.0102	97.09	97.68	97.62
		0.4956	0.0065	98.68		
		0.168	0.0046	97.26		
	Cut20	0.5017	0.0129	97.43	97.56	
		0.5187	0.0093	98.21		
		0.4983	0.0147	97.05		

Table Summary:

Company Name	Product Name	Soil	Conc. (%)	Removal Efficacy (%)	Effective (Yes if >85%)
Inventec	Quicksolv DMC	Nisseki SAS-60E	100	98.84	Yes
Inventec	Quicksolv DMC	Cut20	100	97.11	Yes
J.T. Baker	Acetone	Nisseki SAS-60E	100	97.68	Yes

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J.T. Baker	Acetone	Cut20	100	97.56	Yes

Summary:

Substrates:	Copper
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
J.T. Baker	Acetone	100	97.60	☑	Nisseki SAS-60E 97.68; Cut20 97.56
Inventec Performance Chemicals	Quicksolv DMC	100	98.45	☑	Nisseki SAS-60E 98.84; Cut20 97.11

Conclusion: Both products performed at the same level on the two oils, removing over 97%.