CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2001

DateRun: 01/15/2001

Experimenters: Jason Marshall, John Brunelle

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

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

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To compare cleaning efficiency of similar products from two manufactures

Experimental Procedure: Two products were diluted to five percent using DI water in 600 ml beakers. The solutions were heated to 130 F on a hot plate. Preweighed coupons were contaminated with the various contaminants and weighed again. Next, three coupons with the same contaminant were immersed into a beaker agitated with a magnetic stir bar. Cleaning lasted for five minutes. The coupons were rinsed using tap water at 120 F for 30 seconds and dried for 2 hours at room temperature. Once the coupons were dry, final clean weights were recorded and the efficiency of the cleaning products were determined.

SUBSTRATE MATERIAL:
Table 1. Substrates Cleaned
Substrate Code ID#
Aluminum AL1 5086 H-32
AL2 1100 H-14
Table 2. Contaminants Removed
Contaminant CAS#
Flux FX, Kester 1544 Rosin 64-17-5, 78-92-2, 8050-09-7
Grease GR, KSL-111 64742-57-0, 64742-62-7, 8052-42-4
Lubricant LU, 423 64742-47-8
Oil OI, Hydrolic, East Falls Co. 64742-65-0

Results: Both cleaners had difficulty in removing the lubricant from the aluminum coupons with Emkay removing just over 60% of the lubricant and Magnum only removing just under 50%. Magnum was more successful in cleaning the other three contaminants as shown in the side by side comparison in Table 4.

Table 4. Direct Comparison

Contaminant	Emkay	Magnum
flux	58.33	99.55
grease	78.7	97.19
lubricant	60.43	49.82
oil	87.77	94.13

The results for each cleaner are listed in Table 5.
Table 5. Product Efficiencies

RAW DATA									
Company	Emkay				Company	Magnum Research			
Product	Safety Wash Clear				Product	Aluminum Aerowash			
Classif.	Alk-aq				Classif.	Alk-aq			
Subst/ Cont	AL1-FX	AL1-GR	AL2-LU	AL2-OI	Subst/ Con	AL1-FX	AL1-GR	AL2-LU	AL2-OI
Coupon 1	78.13	52.27	56.28	97.40	Coupon 1	99.14	97.98	42.75	98.39
Coupon 2	51.21	91.17	62.63	78.15	Coupon 2	99.10	96.91	51.76	97.51
Coupon 3	45.65	92.64	62.35	87.76	Coupon 3	100.4	96.66	54.96	86.46
Average	58.33	78.69	60.42	87.77	Average	99.55	97.19	49.82	94.12

Summary:

Substrates:	Aluminum				
Contaminants:	Cutting/Tapping Fluids, Fluxes, Greases, Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**

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Emkay Chemical Company	Safety Wash Clear	5	58.33	☐	flux
Emkay Chemical Company	Safety Wash Clear	5	78.70	☐	grease
Emkay Chemical Company	Safety Wash Clear	5	60.43	☐	lubricant
Emkay Chemical Company	Safety Wash Clear	5	87.77	☑	oil
Magnum Research Corporation	Aluminum Aerowash	5	99.55	☑	flux
Magnum Research Corporation	Aluminum Aerowash	5	97.19	☑	grease
Magnum Research Corporation	Aluminum Aerowash	5	49.82	☐	lubricant
Magnum Research Corporation	Aluminum Aerowash	5	94.13	☑	oil

Conclusion: Magnum Research Aluminum Aerowash removed over 94% of the contaminants for three of four contaminants. Emkay Chemical Safety Wash Clear was successful in removing over 85% of the contaminants in one of four evaluations.