CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2019
DateRun:	08/05/2019
Experimenters:	Nicole Kebler, Julie Nguyen
ClientType:	Electroplating Company
ProjectNumber:	Project #1
Substrates:	Aluminum
PartType:	Part
Contaminants:	Lubricating/Lapping Oils, Oil
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Visual
Purpose:	To evaluate aqueous cleaning products for machine oil removal from Barry Industries parts and determine the best recommended product.

Experimental Procedure:

Two contaminated aluminum parts were provided by the company. One pre-soiled aluminum part was used per cleaner. Dilutions and temperatures used for each cleaner were based on vendor recommendations. Parts were immersed individually into a beaker with a stir bar for 15 minutes, and visual observations were recorded every five minutes. Cleaned parts were rinsed in heated (95^{o} F) tap water for five minutes and dried for five minutes with an air gun at room temperature (68 ^{o}F). All parts were photographed before and after cleaning (see Appendix A). A final cleanliness ranking was conducted comparing the cleaned parts.

Overall Cleanliness Rating Table

Score	Description
1	Total removal of contaminant. No residue.
2	Partial removal of contaminant. Some residue remaining.
3	Minimal removal of contaminant. Substantial amount of residue remaining.

Results:

Visual Observations

Cleaner	5 Mins	10 Mins	15 Mins	Rinse
1	- particles floating in dilution - clear dilution	- dilution getting cloudy - thick layer of bubbles forming	- increased blue particles floating in dilution	- coupon is shiny - no visible residue
2	- micro bubbles coming off of coupon - bubbles forming at top of dilution	- dilution getting cloudy - thick layer of bubbles forming	- dilution getting cloudier	- visible line of soil on coupon (where solution didn't reach) Note: line is etching.

Additional Notes:

Although the CleanerSolutions Database said Emerald HD 2 was safe for aluminum, a visible line appeared after cleaning on the aluminum that wasn't there with the coupons. After confirming etching potential with the vendor, it would not be appropriate to use Emerald HD 2 on aluminum parts.

Overall Cleanliness Ranking

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Cleaner	Ranking
1	1
2	1

Summary:

Substrates:	Aluminum				
Contaminants:	Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Brulin Corporation	Aquavantage 1400	5%	0.00	☑	
Hubbard Hall Inc	Emerald HD2	15%	0.00	☐	

Conclusion: Aquavantage 1400 (5%) was effective. Emerald HD 2 should not be used on aluminum parts. Micro 90 should be considered as a second aqueous alternative based on previous testing.