CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2019
DateRun:	08/05/2019
Experimenters:	Nicole Kebler, Julie Nguyen
ClientType:	Electroplating Company
ProjectNumber:	Project #1
Substrates:	Ceramics
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:	One pre-soiled ceramic part was used per cleaner. Dilutions and temperatures used for each cleaner were based on vendor recommendations. Coupons were immersed with a stir bar individually for 15 minutes with visual observations being recorded every five minutes. Cleaned coupons were rinsed in heated (95^{o} F) tap water for five minutes and dried for five minutes with an air gun. All Barry Industries parts were photographed after cleaning (see Appendix A). A final cleanliness ranking was conducted comparing to clean parts provided by Barry Industries.

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

Ceramic

Cleaner	5 Mins	10 Mins	15 Mins	Rinse
1	- bubbles forming at top of dilution - oil appearance on surface	- soil still remaining on edges	- dilution is clear - thin rim of bubbles - some particles still floating	- dilution is clear - minimal bubbles - no color change
2	- small bubbles forming	- particles floating in dilution	- dilution is clear - thin rim of bubbles - some particles still floating	- dilution is clear - minimal bubbles - no color change
3	- small bubbles floating	- bubbles swirling	- clear thin rim of bubbles	- dilution is clear - minimal bubbles

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				- no color change

Overall Cleanliness Ranking

Cleaner	Ranking
1	1
2	1
3	1

Summary:

Substrates:	Ceramics				
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	☑	
International Products Corporation	Micro 90 Conc.	2%	0.00	☑	

Conclusion: For the ceramic substrate, all chemistries evaluated were effective.