

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2019

DateRun: 08/06/2019

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° F) tap water for five minutes and dried for five minutes with an air gun at room temperature (68 °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<br>- clear dilution                         | - dilution getting cloudy<br>- thick layer of bubbles forming | - increased blue particles floating in dilution | - coupon is shiny<br>- no visible residue  |
| 2       | - micro bubbles coming off of coupon<br>- bubbles forming at top of dilution | - dilution getting cloudy<br>- thick layer of bubbles forming | - dilution getting cloudier                     | - visible line of soil on coupon (where solution didn't reach)<br><br>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.

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## Overall Cleanliness Ranking

| Cleaner | Ranking |
|---------|---------|
| 1       | 1       |
| 2       | 1       |

## Summary:

|                      |                      |                               |                    |                                     |                      |
|----------------------|----------------------|-------------------------------|--------------------|-------------------------------------|----------------------|
| <b>Substrates:</b>   |                      | Aluminum                      |                    |                                     |                      |
| <b>Contaminants:</b> |                      | Lubricating/Lapping Oils, Oil |                    |                                     |                      |
| <b>Company Name:</b> | <b>Product Name:</b> | <b>Conc.:</b>                 | <b>Efficiency:</b> | <b>Effective:</b>                   | <b>Observations:</b> |
| Brulin Corporation   | Aquavantage 1400     | 5%                            |                    | <input checked="" type="checkbox"/> |                      |
| Hubbard Hall Inc     | Emerald HD2          | 15%                           |                    | <input type="checkbox"/>            |                      |

## 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.