

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008

DateRun: 08/07/2008

Experimenters: Heidi Wilcox, Shweta Bansal

ClientType: Machining Company

ProjectNumber: Project #1

Substrates: Steel

PartType: Coupon

Contaminants: Coatings

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate aqueous alternatives using ultrasonic energy on second supplied contaminant.

Experimental Procedure: Six products from previous trials were selected for testing. Five of the products were diluted to 20% and the sixth product was diluted to 5%. Products were heated to 130 F and immersed in a Branson 40 kHz ultrasonic tank and degassed for at least five minutes. Eighteen preweighed coupons were coated with the supplied rust preventative using a handheld swab and weighed a second time to determine the amount of soil added. Three coupons were cleaned with ultrasonic energy for five minutes, rinsed in tap water for 15 seconds at 120 F and dried using compressed air at room temperature for 30 seconds. Final weights were recorded, and efficiencies calculated for each coupon cleaned.

Results: All six products removed more than 85% of the rust preventative, five of which removed more than 97%. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner                     | Initial wt | Final wt | % Removed |
|-----------------------------|------------|----------|-----------|
| Shopmaster LpH              | 0.2113     | 0.0024   | 98.86     |
|                             | 0.1915     | 0.0065   | 96.61     |
|                             | 0.1883     | 0.0083   | 95.59     |
| Aquavantage 1400 GD         | 0.2512     | 0.0046   | 98.17     |
|                             | 0.2158     | 0.0040   | 98.15     |
|                             | 0.2592     | -0.0037  | 101.43    |
| Shopmaster HP               | 0.2616     | 0.0286   | 89.07     |
|                             | 0.2433     | 0.0361   | 85.16     |
|                             | 0.2283     | 0.0221   | 90.32     |
| Inproclean 3800             | 0.2791     | 0.0065   | 97.67     |
|                             | 0.2603     | -0.0034  | 101.31    |
|                             | 0.2445     | 0.0022   | 99.10     |
| Bio T 300 B                 | 0.2305     | 0.0188   | 91.84     |
|                             | 0.2645     | -0.0003  | 100.11    |
|                             | 0.2121     | 0.0044   | 97.93     |
| SC Aircraft & Metal Cleaner | 0.2868     | 0.0040   | 98.61     |
|                             | 0.2760     | -0.0033  | 101.20    |
|                             | 0.2607     | -0.0005  | 100.19    |

Summary:

|                       |                      |               |                    |                                     |                      |
|-----------------------|----------------------|---------------|--------------------|-------------------------------------|----------------------|
| <b>Substrates:</b>    | Steel                |               |                    |                                     |                      |
| <b>Contaminants:</b>  | Coatings             |               |                    |                                     |                      |
| <b>Company Name:</b>  | <b>Product Name:</b> | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>                   | <b>Observations:</b> |
| Buckeye International | Shopmaster LPH       | 20            | 97.02              | <input checked="" type="checkbox"/> |                      |
| Brulin Corporation    | Aquavantage 1400     | 20            | 99.25              | <input checked="" type="checkbox"/> |                      |
| Buckeye International | Shopmaster HP        | 20            | 88.18              | <input checked="" type="checkbox"/> |                      |
| Oakite Products       | Inproclean 3800      | 20            | 99.36              | <input checked="" type="checkbox"/> |                      |

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|                  |   |    |        |                                     |  |
|------------------|---|----|--------|-------------------------------------|--|
| Bio Chem Systems | Bio T 300 B                                   | 5  | 96.63  | <input checked="" type="checkbox"/> |  |
| Gemtek Products  | SC Aircraft & Metal Cleaner Super Concentrate | 20 | 100.00 | <input checked="" type="checkbox"/> |  |

Conclusion: All six will be evaluated next on the supplied grinding fluid.