

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008  
 DateRun: 09/23/2008  
 Experimenters: Jason Marshall  
 ClientType: Machine Construction Company  
 ProjectNumber: Project #2  
 Substrates: Steel  
 PartType: Coupon  
 Contaminants: Coatings  
 Cleaning Methods: Ultrasonics  
 Analytical Methods: Gravimetric

Purpose: To evaluate successful products on second supplied contaminant using ultrasonics and heat.

Experimental Procedure: Eight products were selected from the previous trial based on success on removing the supplied soil. Five products were diluted to 5% using DI water in 400 ml beakers. The other three were used at full strength based on vendor recommendations. Beakers were immersed and heated to 130 F in a Branson 40 kHz ultrasonic tank. Solutions were degassed for five minutes.

Twenty-four preweighed steel coupons were coated with the rust preventative VCI 368 using a hand held swab. Coupons were weighed again to determine the amount of soil added. Three coupons were cleaned in each solution for 10 minutes using ultrasonic energy. Coupons were rinsed for 15 seconds in tap water at 120 F and dried using compressed air at room temperature for 30 seconds. Final weights were recorded and efficiencies calculated.

Results: Six of the eight products removed over 85% of the second supplied contaminant using heated ultrasonics. Five of these products removed over 90%. Kyzen's Ionox HC 2 and Chem Free Corp Ozzy Juice SW 1 were the two products that did not remove over 85%. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner                     | Initial wt | Final wt | % Removed |
|-----------------------------|------------|----------|-----------|
| Aquavantage 1400 GD         |            |          |           |
|                             | 0.4064     | 0.0176   | 95.67     |
|                             | 0.4338     | 0.0218   | 94.97     |
|                             | 0.4076     | 0.0162   | 96.03     |
| Grease Feast                |            |          |           |
|                             | 0.2940     | 0.0321   | 89.08     |
|                             | 0.4619     | 0.0129   | 97.21     |
|                             | 0.4403     | 0.0130   | 97.05     |
| SC Aircraft & Metal Cleaner |            |          |           |
|                             | 0.2726     | 0.0157   | 94.24     |
|                             | 0.2216     | 0.0093   | 95.80     |
|                             | 0.3492     | 0.0180   | 94.85     |
| SC MaxiSolve                |            |          |           |
|                             | 0.3530     | 0.0330   | 90.65     |
|                             | 0.3187     | 0.0211   | 93.38     |
|                             | 0.3699     | 0.0527   | 85.75     |
| Ozzy Juice SW1              |            |          |           |
|                             | 0.3302     | 0.0491   | 85.13     |
|                             | 0.2597     | 0.0457   | 82.40     |
|                             | 0.2371     | 0.0847   | 64.28     |
| Smart Solve 605             |            |          |           |
|                             | 0.3111     | 0.0299   | 90.39     |
|                             | 0.4758     | 0.0171   | 96.41     |
|                             | 0.4421     | 0.0326   | 92.63     |
| Bean-e-doo                  |            |          |           |
|                             | 0.4102     | 0.0102   | 97.51     |
|                             | 0.3815     | 0.0213   | 94.42     |
|                             | 0.5301     | 0.0216   | 95.93     |
| Ionox HC2                   |            |          |           |

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|  |        |        |       |
|--|--------|--------|-------|
|  | 0.4945 | 0.1077 | 78.22 |
|  | 0.3760 | 0.1056 | 71.91 |
|  | 0.4377 | 0.0884 | 79.80 |

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> |
| Brulin Corporation                | Aquavantage 1400                              | 5             | 95.56              | <input checked="" type="checkbox"/> |                      |
| Ensolve Biosystems Inc            | Grease Feast Plus                             | 100           | 94.45              | <input checked="" type="checkbox"/> |                      |
| Gemtek Products                   | SC Aircraft & Metal Cleaner Super Concentrate | 5             | 94.96              | <input checked="" type="checkbox"/> |                      |
| Gemtek Products                   | Safe Care (SC) Maxi Solv                      | 5             | 89.93              | <input checked="" type="checkbox"/> |                      |
| Chem Free Corporation             | SW-1 Ozzy Juice                               | 5             | 77.27              | <input type="checkbox"/>            |                      |
| United Laboratories International | Smart Solve 605                               | 100           | 93.14              | <input checked="" type="checkbox"/> |                      |
| Franmar Chemical                  | Bean-e-doo (Parts Washer Solvent)             | 100           | 95.95              | <input checked="" type="checkbox"/> |                      |
| Kyzen Corporation                 | Ionox HC 2                                    | 5             | 76.65              | <input type="checkbox"/>            |                      |

Conclusion:

The top six products will be used on the third supplied contaminant under the same conditions.