

# 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 third supplied contaminant using heated ultrasonic cleaning.

Experimental Procedure: Six products were selected from the previous trial based on success on removing the first two supplied soils. Three 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.

Eighteen preweighed steel coupons were coated with the rust preventative VCI 369 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: Three products removed over 90% of the third contaminant and the other three removed 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         |            |          |           |
|                             | 0.1576     | 0.0017   | 98.92     |
|                             | 0.1180     | 0.0144   | 87.80     |
|                             | 0.2259     | 0.0050   | 97.79     |
| Grease Feast                |            |          |           |
|                             | 0.2491     | 0.0256   | 89.72     |
|                             | 0.2017     | 0.0210   | 89.59     |
|                             | 0.1083     | 0.0137   | 87.35     |
| SC Aircraft & Metal Cleaner |            |          |           |
|                             | 0.1215     | 0.0185   | 84.77     |
|                             | 0.1011     | 0.0052   | 94.86     |
|                             | 0.1609     | 0.0255   | 84.15     |
| SC MaxiSolve                |            |          |           |
|                             | 0.2304     | 0.0291   | 87.37     |
|                             | 0.2109     | 0.0155   | 92.65     |
|                             | 0.2353     | 0.0062   | 97.37     |
| Smart Solve 605             |            |          |           |
|                             | 0.1505     | 0.0183   | 87.84     |
|                             | 0.1599     | 0.0195   | 87.80     |
|                             | 0.1687     | 0.0113   | 93.30     |
| Bean-e-doo                  |            |          |           |
|                             | 0.1076     | 0.0003   | 99.72     |
|                             | 0.1226     | 0.0103   | 91.60     |
|                             | 0.2734     | 0.0031   | 98.87     |

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             | 94.83              | <input checked="" type="checkbox"/> |                      |  |
| Ensolve Biosystems Inc | Grease Feast Plus    | 100           | 88.89              | <input checked="" type="checkbox"/> |                      |  |

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|                                   |   |     |       |                                     |  |
|-----------------------------------|---|-----|-------|-------------------------------------|--|
| Gemtek Products                   | SC Aircraft & Metal Cleaner Super Concentrate | 5   | 87.93 | <input checked="" type="checkbox"/> |  |
| Gemtek Products                   | Safe Care (SC) Maxi Solv                      | 5   | 92.46 | <input checked="" type="checkbox"/> |  |
| United Laboratories International | Smart Solve 605                               | 100 | 89.65 | <input checked="" type="checkbox"/> |  |
| Franmar Chemical                  | Bean-e-doo (Parts Washer Solvent)             | 100 | 96.73 | <input checked="" type="checkbox"/> |  |

**Conclusion:**

The top three products from all three soils, Bean-e-doo, Aquavantage 1400 GD and SC Aircraft & Metal Cleaner, will be tested using heated immersion cleaning.