

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2000  
 DateRun: 07/21/2000  
 Experimenters: Jason Marshall, John Brunelle  
 ClientType: State Agency  
 ProjectNumber: Project #1  
 Substrates: Aluminum  
 PartType: Coupon  
 Contaminants: Cutting/Tapping Fluids, Greases, Lubricating/Lapping Oils, Oil  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Gravimetric  
 Purpose: To evaluate cleaning effectiveness of selected cleaners.

Experimental Procedure: The three products were selected based on environmental indicators for potential replacement cleaners in parts cleaning. Dilutions were made in 600 ml beakers using DI water. Prewieghed coupons were covered with the various contaminants and weighed a second time to determine the amount applied. Three coupons were cleaned per solution. Products were evaluated at room temperature using stir bar agitation. Cleaning lasted five minutes. Coupons were rinsed in tap water at room temperature for 30 seconds and dried using a Master Appliance Corp, Hot-air gun model HG-301A at 500 F for one minute. SUBSTRATE MATERIAL: The substrates used are listed in Table 1.

Table 1. Substrates

| Substrate | ID#           |
|-----------|---------------|
| Aluminum1 | 202-7075 T-6  |
| Aluminum2 | 202-5052 H-32 |

CONTAMINANTS: The contaminants cleaned in the trial are specified in Table 2.

| Contaminant      | Code | CAS#                              |
|------------------|------|-----------------------------------|
| Oil, Citgo NC400 | OI   | 64-741-89-5, 8052-42-4            |
| Lubricant, 423   | LU   | 64742-57-0, 64742-62-7, 8052-42-4 |
| Grease, KSL-111  | GR   | 64742-47-8                        |

Results: The cleaning results for each cleaner is listed in Table 4 below. During this trial only one of the three products was moderately successful in removing the contaminants from the aluminum surface. The Bio-T V50 removed over 85% of the oil while the other two cleaners only removed 69% (NAB) and 34% (SW8).

Table 4. Cleaning Efficiencies

| Company    | Envirosolution    |        |        |
|------------|-------------------|--------|--------|
| Product    | Bio T V-50        |        |        |
| Subst/Cont | AL1-OI            | AL1-LU | AL2-GR |
| Coupon 1   | 97.47             | 20.69  | 78.26  |
| Coupon 2   | 79.35             | 40.74  | 16.67  |
| Coupon 3   | 79.04             | 0.00   | 79.17  |
| Average    | 85.29             | 20.48  | 58.03  |
| Company    | North American    |        |        |
| Product    | NAB 9000          |        |        |
| Subst/Cont | AL1-OI            | AL1-LU | AL2-GR |
| Coupon 1   | 85.11             | 14.29  | 18.18  |
| Coupon 2   | 68.52             | 15.62  | 35.29  |
| Coupon 3   | 53.22             | 16.67  | 5.88   |
| Average    | 68.95             | 15.53  | 19.79  |
| Company    | Hazwell - ForBest |        |        |
| Product    | Seawash-8         |        |        |

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| Subst/Cont | AL1-OI | AL1-LU | AL2-GR |
|------------|--------|--------|--------|
| Coupon 1   | 31.15  | -15.15 | 0.00   |
| Coupon 2   | 50.27  | -27.78 | 13.64  |
| Coupon 3   | 19.46  | -8.11  | 21.74  |
| Average    | 33.63  | -17.01 | 11.79  |

Summary:

| <b>Substrates:</b>            |                     | Aluminum   |             |                                     |               |
|-------------------------------|---------------------|--|-------------|-------------------------------------|---------------|
| <b>Contaminants:</b>          |                     | Cutting/Tapping Fluids, Greases, Lubricating/Lapping Oils, Oil |             |                                     |               |
| Company Name:                 | Product Name:       | Conc.:   | Efficiency: | Effective:                          | Observations: |
| Bio Chem Systems              | Bio T V 50          | 10   | 85.29       | <input checked="" type="checkbox"/> | oil           |
| Bio Chem Systems              | Bio T V 50          | 10   | 20.48       | <input type="checkbox"/>            | lubricant     |
| Bio Chem Systems              | Bio T V 50          | 10   | 58.03       | <input type="checkbox"/>            | grease        |
| North Atlantic Bio Industries | NAB 9000            | 10   | 68.95       | <input type="checkbox"/>            | oil           |
| North Atlantic Bio Industries | NAB 9000            | 10   | 15.53       | <input type="checkbox"/>            | lubricant     |
| North Atlantic Bio Industries | NAB 9000            | 10   | 19.79       | <input type="checkbox"/>            | grease        |
| Warren Chemical Company       | Sea Wash 8 No Force | 10   | 33.63       | <input type="checkbox"/>            | oil           |
| Warren Chemical Company       | Sea Wash 8 No Force | 10   | -17.01      | <input type="checkbox"/>            | lubricant     |
| Warren Chemical Company       | Sea Wash 8 No Force | 10   | 11.79       | <input type="checkbox"/>            |               |

Conclusion: