

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008  
 DateRun: 11/25/2008  
 Experimenters: Johanna Oviedo  
 ClientType: Lab  
 ProjectNumber: Project #1  
 Substrates: Stainless Steel  
 PartType: Coupon  
 Contaminants: Cutting/Tapping Fluids  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Visual

Purpose: To test nontoxic industrial cleaning solutions for oil removal

Experimental Procedure: Basic cleaning performance testing was conducted using ASTM G122 as the bases for cleaning. Products were selected based on the compatibility of substrate and removal of foreign substance. Used 5% concentration and heated the samples at 135F. The steel coupons were immersed in a product for 5 minutes, rinsed for 30 seconds in tap water at 120F and dried in 30 seconds using compressed air is room temperature. Coupons were coated with used oil. Using a handheld swab and allowed to dry for 144 minutes at room temperature. The contaminated coupons were weighed again to determine the amount of soil added. After cleaning process, the final weights were recorded, efficiencies were calculated and recorded.

Results:

| Cleaner        | Initial wt | Final wt | % Removed |
|----------------|------------|----------|-----------|
| SW 6           |            |          |           |
|                | 0.0625     | 0.0179   | 71.36     |
|                | 0.0516     | 0.0216   | 58.14     |
|                | 0.0410     | 0.0121   | 70.49     |
| Metalnox M6410 |            |          |           |
|                | 0.0243     | 0.0119   | 51.03     |
|                | 0.0306     | 0.0152   | 50.33     |
|                | 0.0353     | 0.0190   | 46.18     |
| Daraclean 203  |            |          |           |
|                | 0.0600     | 0.0247   | 58.83     |
|                | 0.0267     | -0.0016  | 105.99    |
|                | 0.0382     | 0.0074   | 80.63     |
| Daraclean 257  |            |          |           |
|                | 0.0447     | 0.0125   | 72.04     |
|                | 0.0600     | 0.0125   | 79.17     |
|                | 0.0384     | 0.0150   | 60.94     |
| Metalnox M6432 |            |          |           |
|                | 1.1187     | 1.0446   | 6.62      |
|                | 0.0550     | 0.0090   | 83.64     |
|                | 0.0914     | 0.0088   | 90.37     |

Summary:

|                       |   |               |                    |                          |                      |
|-----------------------|---|---------------|--------------------|--------------------------|----------------------|
| <b>Substrates:</b>    | Stainless Steel                                   |               |                    |                          |                      |
| <b>Contaminants:</b>  | Cutting/Tapping Fluids                            |               |                    |                          |                      |
| <b>Company Name:</b>  | <b>Product Name:</b>                              | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>        | <b>Observations:</b> |
| Chem Free Corporation | SW-6 Ozzy Juice Select Metals Degreasing Solution | 5             | 66.66              | <input type="checkbox"/> |                      |
| Kyzen Corporation     | Metalnox M6410DT                                  | 5             | 49.18              | <input type="checkbox"/> |                      |
| Magnaflux             | Daraclean 203                                     | 5             | 81.82              | <input type="checkbox"/> |                      |
| Magnaflux             | Daraclean 257                                     | 5             | 70.71              | <input type="checkbox"/> |                      |
| Kyzen Corporation     | Metalnox M6432 (For Comparison Only)              | 5             | 60.21              | <input type="checkbox"/> |                      |

Conclusion: No product removed over 85% of the tapping fluid using immersion cleaning.