

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2007  
 DateRun: 10/17/2007  
 Experimenters: Jason Marshall, Shweta Bansal  
 ClientType: Environmental Service Firm  
 ProjectNumber: Project #1  
 Substrates: Cadmium plated steel  
 PartType: Coupon  
 Contaminants: Carbon Deposits, Cutting/Tapping Fluids, Greases, Lubricating/Lapping Oils, Dirt, Oil  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Gravimetric  
 Purpose: To evaluate cleaning performance of samples taken after 6 months of use.

Experimental Procedure: Six samples from three locations (two from each) were emptied into 400 ml beakers and used at requested temperature for cleaning. In addition, an unused cleaning product was included for comparison.

Twenty-one preweighed coupons were coated with a composite soil made from the filtration bags collected at the three sites. The contaminant mix was allowed to dry on the coupons for one hour. After this drying, a second weight was recorded to determine the amount of soil added. Three coupons were immersed into each sample and cleaned for 5 minutes using no agitation. At the end of the cleaning, coupons were rinsed for 15 seconds in tap water and dried using compressed air at room temperature. Once the coupons were dry, the final weights were recorded, and efficiencies were calculated.

Results: There were no major differences in the cleaning efficiencies for all the samples from each site. The second sample collected from Flahertys was the only samples to have efficiencies lower than 98%. The table below lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner     | Initial wt | Final wt | % Removed |
|-------------|------------|----------|-----------|
| Bergdales 5 | 0.4489     | 0.0108   | 97.59     |
|             | 0.8501     | 0.0129   | 98.48     |
|             | 0.9977     | 0.0081   | 99.19     |
| Bergdales 6 | 1.0125     | 0.0083   | 99.18     |
|             | 0.6349     | 0.0122   | 98.08     |
|             | 0.4262     | 0.0125   | 97.07     |
| Flahertys 5 | 0.6779     | 0.0091   | 98.66     |
|             | 1.2229     | 0.0069   | 99.44     |
|             | 0.7464     | 0.0105   | 98.59     |
| Flahertys 6 | 0.4225     | 0.0208   | 95.08     |
|             | 0.3789     | 0.0148   | 96.09     |
|             | 0.9618     | 0.0077   | 99.20     |
| Syversons 5 | 0.7991     | 0.0083   | 98.96     |
|             | 0.8121     | 0.0199   | 97.55     |
|             | 0.9886     | 0.0147   | 98.51     |
| Syversons 6 | 0.6100     | 0.0206   | 96.62     |
|             | 0.6814     | 0.0065   | 99.05     |
|             | 1.0462     | 0.0071   | 99.32     |
| New         | 1.0989     | 0.0097   | 99.12     |
|             | 1.0689     | 0.0113   | 98.94     |
|             | 0.8155     | 0.0123   | 98.49     |

|          |                      |                        |   |                    |                          |                      |
|----------|----------------------|------------------------|---|--------------------|--------------------------|----------------------|
| Summary: | <b>Substrates:</b>   |                        | Cadmium plated steel  |                    |                          |                      |
|          | <b>Contaminants:</b> |                        | Carbon Deposits, Cutting/Tapping Fluids, Greases, Lubricating/Lapping Oils, Dirt, Oil |                    |                          |                      |
|          | <b>Company Name:</b> | <b>Product Name:</b>   | <b>Conc.:</b>   | <b>Efficiency:</b> | <b>Effective:</b>        | <b>Observations:</b> |
|          | Kleer Flo Company    | Degreasol Formula 99-R |   |                    | <input type="checkbox"/> |                      |

Conclusion: Cleaning performances were consistent for all three locations and the fresh cleaning product.