

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2003
 DateRun: 03/04/2003
 Experimenters: Jason Marshall
 ClientType: Medical Instrument Mfr
 ProjectNumber: Project #1
 Substrates: Plastic
 PartType: Part
 Contaminants: Hucker's Soil
 Cleaning Methods: Mechanical Agitation
 Analytical Methods: Gravimetric, Photography
 Purpose: To modify cleaning parameters to improve cleaning efficiency

Experimental Procedure: Four cleaners were selected from the previous test. Three products were diluted to 10% and the fourth was diluted to 5% using DI water in 600 ml beakers. All of the cleaners were heated to 130 F on a hot plate. Photographs were taken of clean tubing pieces. The inside of 12 preweighed PVC tubing pieces (3" long) were coated with the supplied Hucker' Soil (Creamy Peanut Butter, Salted Butter, Wheat gluten, Egg Yolk, Evaporated milk, DI water, Printer's ink with boiled linseed oil, India Ink, Saline Solution) using a squeeze bulb and then allowed to dry. The tubing was weighed and photographed again to determine the amount of soil added. Three pieces were cleaned in each solution for 10 minutes using mechanical agitation (moving pieces back and forth at an angle) at 130 F. Rinsing was performed for 15 seconds in tap water at 120 F and followed by drying with a forced air at for 30 seconds at 68 F. Once the tubing cooled to room temperature, final weights were recorded, pictures were taken and efficiencies were calculated.

Results: A majority of the contaminant was removed by each cleaning solutions. Each product did leave some soils behind. Only one product, Micro 90, had very little amounts of Hucker's soil visible in discrete spots. Others had grey films across the tubing. The table below lists the amount of soil added and removed from the PVC tubing.

Table 1. Soil Removal

| Cleaner | Initial wt | Final wt | % Removed |
|------------|------------|----------|-----------|
| Micro 90 | 0.3200 | 0.0021 | 99.34 |
| | 0.3408 | 0.0005 | 99.85 |
| | 0.2829 | 0.0010 | 99.65 |
| United 450 | 0.4864 | 0.0017 | 99.65 |
| | 0.4298 | 0.0035 | 99.19 |
| | 0.4273 | 0.0037 | 99.13 |
| Lestoil | 0.4272 | 0.0113 | 97.35 |
| | 0.3185 | 0.0120 | 96.23 |
| | 0.4729 | 0.0134 | 97.17 |
| Sea Wash 8 | 0.4634 | 0.0136 | 97.07 |
| | 0.6550 | 0.0210 | 96.79 |
| | 0.5172 | 0.0179 | 96.54 |

Summary:

| Substrates: | Plastic | | | | |
|------------------------------------|----------------------|--------|-------------|-------------------------------------|---------------|
| Contaminants: | Hucker's Soil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| International Products Corporation | Micro 90 Conc. | 10 | 99.61 | <input checked="" type="checkbox"/> | |
| United Laboratories International | United 450 All Clear | 10 | 99.32 | <input checked="" type="checkbox"/> | |
| Warren Chemical Company | Sea Wash 8 No Force | 10 | 96.80 | <input checked="" type="checkbox"/> | |
| Clorox Company | Lestoil | 5 | 96.92 | <input checked="" type="checkbox"/> | |

Conclusion: The increase in concentration and cleaning time provided little benefit to Micro 90, but increased the effectiveness of United 450 All Clear. Despite the increases, there was still soil remaining behind on the PVC tubing. Increasing temperature will be reviewed next for Micro 90 and Untied 450 All Clear.