

Toxics Use Reduction Institute’s Cleaning Lab

UMass Lowell

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**TURI SURFACE SOLUTIONS LABORATORY**

**EVALUATION SUMMARY**

**SCL #:** 2019-26-441-1-1

**Date Run:** 4/5/2019

**Experimenters:** LG, JR, SA, TK, AW

**Client Type:** Janitorial

**Project Number:**

**Substrates:** Stainless Steel, Plastic, Porcelain, Granite

**Part Type:** Coupons

**Contaminants:** DCC 17

**Cleaning Methods:** Manual - SLW

**Analytical Methods:** Gravimetric, Visual

**Purpose:** Evaluate the ability of the three cleaners (E-Mop, Lysol Power Bath Cleaner, Scrubbing Bubbles) on air dried DCC 17 soil on four substrates (stainless steel, plastic, porcelain, granite) using SLW.

**Experimental Procedure:** Three cleaners were compared, E-Mop, Lysol Power Bath Cleaner and Scrubbing Bubbles. The substrates cleaned were stainless steel, plastic, porcelain and granite. The contaminant used was DCC 17 soil. The DCC 17 soil was made using 33 wt.% vegetable shortening, 33 wt.% lard, 33 wt.% vegetable oil, and 1 wt.% carbon lampblack. The soil was kept heated between 50-55 °C. The coupons’ initial weights were taken and then about 0.5000 g of DCC 17 soil was applied to each coupon. The coupons were set to dry at room temperature for at least 24 hours. Once dried, the contaminated weights were taken, three coupons of each substrate were placed in the SLW unit and a KC Wypal reinforced paper towel was attached to the cleaning sled and treated with two sprays of cleaning solution. Each coupon was sprayed twice with the same cleaning solution. The cleaning unit was run for 20 cycles (equivalent of 30 seconds of cleaning). At the end of the cleaning cycle, the coupons were wiped once with a dry paper towel. Coupons dried overnight and final weights were recorded. Efficiencies were calculated and recorded.

**Chemistries Evaluated:** E-Mop (One scoop of salt was added to water to make E-Mop cleaner (1 scoop of salt = 3.0516 g), the resulting concentration was 310 ppm), Lysol Power Bath Cleaner (RTU), Scrubbing Bubbles (RTU)

**Results:**

**E-Mop**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Substrate** | **Initial wt of cont.** | **Final wt of cont.** | **%Cont Removed** | **% Average** |
| Stainless Steel |  |  |  |  |
|  | 0.5003 | 0.0569 | **88.62** | 89.59 |
| 0.5123 | 0.0583 | **88.61** |
| 0.5055 | 0.0428 | **91.53** |
| Plastic |  |  |  |  |
|  | 0.5047 | 0.0131 | **97.40** | 97.10 |
| 0.5088 | 0.0223 | **95.62** |
| 0.5554 | 0.0096 | **98.27** |
| Porcelain |  |  |  |  |
|  | 0.4914 | 0.0236 | **95.20** | 95.95 |
| 0.5645 | 0.0228 | **95.96** |
| 0.5365 | 0.0177 | **96.70** |
| Granite |  |  |  |  |
|  | 0.5726 | 0.0012 | **99.79** | 98.72 |
| 0.5809 | 0.0138 | **97.62** |
| 0.5630 | 0.0071 | **98.74** |

**Lysol Power Bath Cleaner**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Substrate** | **Initial wt of cont.** | **Final wt of cont.** | **%Cont Removed** | **% Average** |
| Stainless Steel |  |  |  |  |
|  | 0.5479 | 0.0533 | **90.27** | 94.73 |
| 0.6386 | 0.0162 | **97.46** |
| 0.5751 | 0.0204 | **96.45** |
| Plastic |  |  |  |  |
|  | 0.5738 | 0.0155 | **97.30** | 94.66 |
| 0.5814 | 0.0523 | **91.00** |
| 0.4986 | 0.0215 | **95.69** |
| Porcelain |  |  |  |  |
|  | 0.5103 | 0.0316 | **93.81** | 92.24 |
| 0.5069 | 0.0362 | **92.86** |
| 0.4873 | 0.0484 | **90.07** |
| Granite |  |  |  |  |
|  | 0.5262 | 0.0186 | **96.47** | 97.20 |
| 0.4924 | 0.0144 | **97.08** |
| 0.6097 | 0.0118 | **98.06** |

**Scrubbing Bubbles**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Substrate** | **Initial wt of cont.** | **Final wt of cont.** | **%Cont Removed** | **% Average** |
| Stainless Steel |  |  |  |  |
|  | 0.5640 | 0.0480 | **91.49** | 90.18 |
| 0.5331 | 0.0573 | **89.25** |
| 0.5850 | 0.0596 | **89.81** |
| Plastic |  |  |  |  |
|  | 0.6284 | 0.0497 | **92.09** | 90.89 |
| 0.5403 | 0.0610 | **88.71** |
| 0.5033 | 0.0409 | **91.87** |
| Porcelain |  |  |  |  |
|  | 0.4860 | 0.0286 | **94.12** | 93.32 |
| 0.5319 | 0.0299 | **94.38** |
| 0.5301 | 0.0453 | **91.45** |
| Granite |  |  |  |  |
|  | 0.5376 | 0.0360 | **93.30** | 93.32 |
| 0.5391 | 0.0247 | **95.42** |
| 0.5402 | 0.0473 | **91.24** |

**Summary**

**Substrates:** Stainless Steel, Plastic, Porcelain

**Contaminants:** DCC 17

Result of the effectiveness of two cleaner by using gravimetric analysis:

|  |  |  |  |
| --- | --- | --- | --- |
| Company Name | Product Name | Conc. | % Removal |
|  | E-Mop |  | 95.34 |
|  | Lysol Power Bath Cleaner | 100% | 94.71 |
|  | Scrubbing Bubbles | 100 % | 91.93 |

**Conclusion:** E-mop cleaner had the highest overall removal percentage for every substrate with a 95.34%, followed by the Lysol Power Bath Cleaner having the second highest overall removal percentage for every substrate with an 94.71% overall removal of contaminant. The least effective cleaner for overall removal of contaminant was Scrubbing Bubbles with an overall removal percentage of 91.93%.