

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2024
 DateRun: 07/01/2024
 Experimenters: Cindy McClaughlin
 ClientType: Cleaner Manufacturer
 ProjectNumber: Project #1
 Substrates: Plastic, Stainless Steel
 PartType: Coupon
 Contaminants: Food
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric, Visual
 Purpose: Benchmark testing of ICT 1648L for Craft Beverage project.

Experimental Procedure: Three pre weighed coupons of each substrate, plastic and stainless steel, were used per soil for a total of 12 coupons per cleaner concentration tested. Half of the coupons were soiled with tea and tea leaves with a swab. The other half were soiled with coffee and coffee grounds with a swab. The coupons were then baked in the oven for 40 minutes at a temperature of 200 F to adhere the soils to the coupons and to initiate staining. The dirty weights of the coupons and visual rankings were then recorded. The coupons were then subjected to 10 minutes of heated immersion at 120F in their respective cleaner dilutions with a stir bar set to 300 rpm. The cleaner was used at the vendor recommended concentrations (2% and 1%) . The coupons were then removed from the cleaner and the clean visual rankings were recorded. The coupons were allowed to dry overnight before clean weights were recorded. Visual rankings were based on the key below.

Visual Rankings
 1= 100% soil removed
 2= 75% soil removed
 3= 50% soil removed
 4= 25% soil removed
 5= 0% soil removed

Results: Gravimetric:

| Cleaner | Substrate | Soil | Initial wt of cont. | Final wt of cont. | %Cont Removed | AVG % soil | AVG % substrate | Overall % |
|--------------|-----------------|------------|---------------------|-------------------|---------------|------------|-----------------|-----------|
| ICT 1648L 2% | Stainless Steel | Tea Leaves | 0.1750 | 0.0024 | 98.63 | 99.25 | 98.39 | 97.20 |
| | | | 0.4443 | 0.0026 | 99.41 | | | |
| | | | 0.8174 | 0.0024 | 99.71 | | | |
| | | Coffee | 0.0758 | 0.0023 | 96.97 | 97.53 | | |
| | | | 0.1063 | 0.0027 | 97.46 | | | |
| | | | 0.1591 | 0.0029 | 98.18 | | | |
| | Plastic | Tea Leaves | 1.0105 | 0.0183 | 98.19 | 97.29 | 96.00 | |
| | | | 1.1791 | 0.0509 | 95.68 | | | |
| | | | 0.5228 | 0.0104 | 98.01 | | | |
| | | Coffee | 0.1449 | 0.0096 | 93.37 | 94.48 | | |
| | | | 0.2227 | 0.0123 | 79.66 | | | |
| | | | 0.1727 | 0.0064 | 96.29 | | | |
| ICT 1648L 1% | Stainless Steel | Tea Leaves | 0.1795 | 0.0002 | 99.89 | 99.02 | 98.53 | 97.88 |
| | | | 0.4268 | 0.0046 | 98.92 | | | |
| | | | 0.1814 | 0.0032 | 98.24 | | | |
| | | Coffee | 0.2332 | 0.0031 | 98.67 | 98.04 | | |
| | | | 0.1924 | 0.0060 | 96.88 | | | |
| | | | 0.2080 | 0.0030 | 98.56 | | | |
| | Plastic | Tea Leaves | 0.5828 | 0.0002 | 99.97 | 99.73 | 97.24 | |
| | | | 0.4706 | 0.0006 | 99.87 | | | |
| | | | 0.7154 | 0.0046 | 99.36 | | | |
| | | Coffee | 0.2171 | 0.0054 | 97.51 | 94.75 | | |
| | | | 0.2426 | 0.0157 | 93.53 | | | |
| | | | | | | | | |

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|--|--|--------|--------|-------|--------|--|--|
| | | 0.2863 | 0.0194 | 93.22 | Visual | | |
|--|--|--------|--------|-------|--------|--|--|

Visual:

| Cleaner | Substrate | Soil | Visual | AVG soil | AVG substrate | Overall |
|--------------|-----------------|------------|--------|----------|---------------|---------|
| ICT 1648L 2% | Stainless Steel | Tea Leaves | 1 | 1 | 1 | 1 |
| | | | 1 | | | |
| | | | 1 | | | |
| | | Coffee | 1 | 1 | | |
| | | | 1 | | | |
| | | | 1 | | | |
| | Plastic | Tea Leaves | 1 | 1 | 1 | |
| | | | 1 | | | |
| | | | 1 | | | |
| | | Coffee | 1 | 1 | | |
| | | | 1 | | | |
| | | | 1 | | | |
| ICT 1648L 1% | Stainless Steel | Tea Leaves | 1 | 1.3 | 1.8 | 1.6 |
| | | | 1.5 | | | |
| | | | 1.5 | | | |
| | | Coffee | 2 | 2.3 | | |
| | | | 3 | | | |
| | | | 2 | | | |
| | Plastic | Tea Leaves | 1 | 1 | 1.4 | |
| | | | 1 | | | |
| | | | 1 | | | |
| | | Coffee | 1.5 | 1.8 | | |
| | | | 2 | | | |
| | | | 2 | | | |

Summary:

| | | | | | |
|----------------------------------------|-----------------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Plastic, Stainless Steel | | | | |
| Contaminants: | Food | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Innovative Chemical Technologies, Inc. | Virdivis FB1000 (ICT 1648L) | 2% | 97.20 | <input checked="" type="checkbox"/> | |
| Innovative Chemical Technologies, Inc. | Virdivis FB1000 (ICT 1648L) | 1% | 97.88 | <input checked="" type="checkbox"/> | |

Conclusion:

Both 1% and 2% concentrations of the ICT 1648L were highly effective in removing tea leaves and coffee from both substrates using heated immersion (120F) gravimetrically. The 2% concentration was highly effective in removing any staining from the coupons, while the 1% concentration struggled to fully remove staining from the coffee soil.