

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2014

DateRun: 03/07/2014

Experimenters: Kathleen Tenaglia, Alicia Melvin

ClientType: Cleaning Company

ProjectNumber: Project #1

Substrates: Ceramics, Plastic, Stainless Steel

PartType: Coupon

Contaminants:

Cleaning Methods: Steam

Analytical Methods: Visual

Purpose: The objective of this study was to determine the effectiveness of commercially available steam devices for disinfection

Experimental Procedure: All tests performed in triplicate with pos and neg controls.
All tests were performed with a 30 second contact time.
All tests were performed with *S. aureus* and *E. coli*.
Tests were performed on aluminum and stainless steel.
Towel variations included: Microfiber washed with no fabric softener
TNTC= Too Numerous to Count (>300 Colonies)

Lab Methods

Day 1

- Subculture Bacteria and Prepare Supplies.
- o Make Tryptic Soy Agar Plates
- o Autoclave Supplies
- o Gather Equipment

Day 2

- Conduct Run
- o Set up Biological Safety Cabinet
- o Spot Coupon Surface with Inoculation, plate Standardized Inoculum.
- o Prepare Controls
- o Test Cleaning
- o Wrist Action Shaker
- o Dilutions
- o Plate

Day 3

- Count Plates
- o Determine Effectiveness

| Results: | Organism | Coupon | Test | Dilution | Result | Duplicate result |
|----------|------------------|----------|--------------|-------------------|--------|------------------|
| | <i>S. aureus</i> | Aluminum | Negative | 1:1 | 2 | 0 |
| | <i>S. aureus</i> | Aluminum | Positive | 1:1 | TNTC | TNTC |
| | <i>S. aureus</i> | Aluminum | Positive | 1:10 | TNTC | TNTC |
| | <i>S. aureus</i> | Aluminum | Positive | 1:100 | 50 | 63 |
| | <i>S. aureus</i> | Aluminum | Positive | 1:1000 | 2 | 2 |
| | <i>S. aureus</i> | Aluminum | Standard In. | 10 ⁻⁹ | TNTC | TNTC |
| | <i>S. aureus</i> | Aluminum | Standard In. | 10 ⁻¹⁰ | TNTC | TNTC |
| | <i>S. aureus</i> | Aluminum | Standard In. | 10 ⁻¹¹ | 188 | 180 |
| | <i>S. aureus</i> | Aluminum | Standard In. | 10 ⁻¹² | 108 | 95 |
| | <i>S. aureus</i> | Aluminum | 1 | 1:1 | 0 | 0 |

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| | | | | | |
|-----------|----------|---|--------|---|---|
| S. aureus | Aluminum | 1 | 1:10 | 1 | 0 |
| S. aureus | Aluminum | 1 | 1:100 | 1 | 0 |
| S. aureus | Aluminum | 1 | 1:1000 | 1 | 0 |
| S. aureus | Aluminum | 2 | 1:1 | 0 | 0 |
| S. aureus | Aluminum | 2 | 1:10 | 1 | 0 |
| S. aureus | Aluminum | 2 | 1:100 | 1 | 0 |
| S. aureus | Aluminum | 2 | 1:1000 | 3 | 0 |
| S. aureus | Aluminum | 3 | 1:1 | 1 | 0 |
| S. aureus | Aluminum | 3 | 1:10 | 2 | 2 |
| S. aureus | Aluminum | 3 | 1:100 | 0 | 0 |
| S. aureus | Aluminum | 3 | 1:1000 | 1 | 0 |

| Organism | Coupon | Test | Dilution | Result | Duplicate result |
|-----------|----------|--------------|-------------------|--------|------------------|
| S. aureus | Aluminum | Negative | 1:1 | 2 | 0 |
| S. aureus | Aluminum | Positive | 1:1 | TNTC | TNTC |
| S. aureus | Aluminum | Positive | 1:10 | TNTC | TNTC |
| S. aureus | Aluminum | Positive | 1:100 | 50 | 63 |
| S. aureus | Aluminum | Positive | 1:1000 | 2 | 2 |
| S. aureus | Aluminum | Standard In. | 10 ⁻⁹ | TNTC | TNTC |
| S. aureus | Aluminum | Standard In. | 10 ⁻¹⁰ | TNTC | TNTC |
| S. aureus | Aluminum | Standard In. | 10 ⁻¹¹ | 188 | 180 |
| S. aureus | Aluminum | Standard In. | 10 ⁻¹² | 108 | 95 |
| S. aureus | Aluminum | 1 | 1:1 | 0 | 0 |
| S. aureus | Aluminum | 1 | 1:10 | 1 | 0 |
| S. aureus | Aluminum | 1 | 1:100 | 1 | 0 |
| S. aureus | Aluminum | 1 | 1:1000 | 1 | 0 |
| S. aureus | Aluminum | 2 | 1:1 | 0 | 0 |
| S. aureus | Aluminum | 2 | 1:10 | 1 | 0 |
| S. aureus | Aluminum | 2 | 1:100 | 1 | 0 |
| S. aureus | Aluminum | 2 | 1:1000 | 3 | 0 |
| S. aureus | Aluminum | 3 | 1:1 | 1 | 0 |
| S. aureus | Aluminum | 3 | 1:10 | 2 | 2 |
| S. aureus | Aluminum | 3 | 1:100 | 0 | 0 |

CLEANING LABORATORY EVALUATION SUMMARY

| | | | | | |
|-----------|----------|---|--------|---|---|
| S. aureus | Aluminum | 3 | 1:1000 | 1 | 0 |
|-----------|----------|---|--------|---|---|

| Organism | Coupon | Test | Dilution | Result | Duplicate result |
|-----------|----------|--------------|-------------------|--------|------------------|
| S. aureus | Aluminum | Negative | 1:1 | 0 | 0 |
| S. aureus | Aluminum | Positive | 1:1 | TNTC | TNTC |
| S. aureus | Aluminum | Positive | 1:10 | TNTC | TNTC |
| S. aureus | Aluminum | Positive | 1:100 | TNTC | TNTC |
| S. aureus | Aluminum | Positive | 1:1000 | TNTC | TNTC |
| S. aureus | Aluminum | Standard In. | 10 ⁻⁹ | TNTC | TNTC |
| S. aureus | Aluminum | Standard In. | 10 ⁻¹⁰ | TNTC | TNTC |
| S. aureus | Aluminum | Standard In. | 10 ⁻¹¹ | TNTC | TNTC |
| S. aureus | Aluminum | Standard In. | 10 ⁻¹² | TNTC | TNTC |
| S. aureus | Aluminum | 1 | 1:1 | 0 | 0 |
| S. aureus | Aluminum | 1 | 1:10 | 0 | 0 |
| S. aureus | Aluminum | 1 | 1:100 | 0 | 0 |
| S. aureus | Aluminum | 1 | 1:1000 | 0 | 0 |
| S. aureus | Aluminum | 2 | 1:1 | 0 | 0 |
| S. aureus | Aluminum | 2 | 1:10 | 1 | 2 |
| S. aureus | Aluminum | 2 | 1:100 | 0 | 0 |
| S. aureus | Aluminum | 2 | 1:1000 | 0 | 0 |
| S. aureus | Aluminum | 3 | 1:1 | 0 | 0 |
| S. aureus | Aluminum | 3 | 1:10 | 0 | 4 |
| S. aureus | Aluminum | 3 | 1:100 | 0 | 0 |
| S. aureus | Aluminum | 3 | 1:1000 | 0 | 0 |

| Organism | Coupon | Test | Dilution | Result | Duplicate result |
|-----------|-----------------|--------------|-------------------|--------|------------------|
| S. aureus | Stainless Steel | Negative | 1:1 | 0 | 0 |
| S. aureus | Stainless Steel | Positive | 1:1 | TNTC | TNTC |
| S. aureus | Stainless Steel | Positive | 1:10 | TNTC | TNTC |
| S. aureus | Stainless Steel | Positive | 1:100 | 36 | 33 |
| S. aureus | Stainless Steel | Positive | 1:1000 | 5 | 3 |
| S. aureus | Stainless Steel | Standard In. | 10 ⁻⁹ | TNTC | TNTC |
| S. aureus | Stainless Steel | Standard In. | 10 ⁻¹⁰ | TNTC | TNTC |

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| | | | | | |
|-----------|-----------------|--------------|-------------------|------|------|
| S. aureus | Stainless Steel | Standard In. | 10 ⁻¹¹ | TNTC | TNTC |
| S. aureus | Stainless Steel | Standard In. | 10 ⁻¹² | TNTC | TNTC |
| S. aureus | Stainless Steel | 1 | 1:1 | 0 | 0 |
| S. aureus | Stainless Steel | 1 | 1:10 | 0 | 0 |
| S. aureus | Stainless Steel | 1 | 1:100 | 0 | 0 |
| S. aureus | Stainless Steel | 1 | 1:1000 | 0 | 0 |
| S. aureus | Stainless Steel | 2 | 1:1 | TNTC | TNTC |
| S. aureus | Stainless Steel | 2 | 1:10 | TNTC | TNTC |
| S. aureus | Stainless Steel | 2 | 1:100 | 238 | 202 |
| S. aureus | Stainless Steel | 2 | 1:1000 | 19 | 31 |
| S. aureus | Stainless Steel | 3 | 1:1 | TNTC | TNTC |
| S. aureus | Stainless Steel | 3 | 1:10 | TNTC | TNTC |
| S. aureus | Stainless Steel | 3 | 1:100 | 83 | 78 |
| S. aureus | Stainless Steel | 3 | 1:1000 | 13 | 15 |

| Organism | Coupon | Test | Dilution | Result | Duplicate result |
|----------|-----------------|--------------|-------------------|--------|------------------|
| E. coli | Stainless Steel | Negative | 1:1 | 0 | 0 |
| E. coli | Stainless Steel | Positive | 1:1 | TNTC | TNTC |
| E. coli | Stainless Steel | Positive | 1:10 | TNTC | TNTC |
| E. coli | Stainless Steel | Positive | 1:100 | 172 | 178 |
| E. coli | Stainless Steel | Positive | 1:1000 | 14 | 28 |
| E. coli | Stainless Steel | Standard In. | 10 ⁻⁸ | TNTC | TNTC |
| E. coli | Stainless Steel | Standard In. | 10 ⁻⁹ | TNTC | TNTC |
| E. coli | Stainless Steel | Standard In. | 10 ⁻¹⁰ | | |
| E. coli | Stainless Steel | Standard In. | 10 ⁻¹¹ | 140 | 163 |
| E. coli | Stainless Steel | 1 | 1:1 | 0 | 0 |
| E. coli | Stainless Steel | 1 | 1:10 | 0 | 0 |
| E. coli | Stainless Steel | 1 | 1:100 | 0 | 0 |
| E. coli | Stainless Steel | 1 | 1:1000 | 0 | 0 |
| E. coli | Stainless Steel | 2 | 1:1 | TNTC | TNTC |
| E. coli | Stainless Steel | 2 | 1:10 | TNTC | TNTC |
| E. coli | Stainless Steel | 2 | 1:100 | TNTC | TNTC |
| E. coli | Stainless Steel | 2 | 1:1000 | 55 | 61 |

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| | | | | | |
|---------|-----------------|---|--------|------|---------------|
| E. coli | Stainless Steel | 3 | 1:1 | TNTC | TNTC |
| E. coli | Stainless Steel | 3 | 1:10 | TNTC | TNTC |
| E. coli | Stainless Steel | 3 | 1:100 | TNTC | TNTC |
| E. coli | Stainless Steel | 3 | 1:1000 | 152 | Plate Dropped |

- Shark
 - o Versatile
 - o Tested on Hardwood, Tile, Granite, Baseboards, and Walls
 - o Temperature Control
 - o Easy Lift Out Hand Unit
 - o Water Reservoir Easy to Fill, Lasts
 - o Awkward Plug on Side of Unit
- Orek
 - o Floor Unit Only
 - o Feels "Cheap/Flimsy" to Use

Summary:

| | | | | | |
|----------------------|----------------------|------------------------------------|--------------------|-------------------------------------|---|
| Substrates: | | Ceramics, Plastic, Stainless Steel | | | |
| Contaminants: | | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Water | Water | 100 | | <input checked="" type="checkbox"/> | Steam units effective at multilog reduction of bacteria |

Conclusion: