



Interface Research and Development  
Tel: (706) 812-6266; Fax: (706) 883-6198  
1603 Executive Drive  
Lagrange, GA 30241

Lab Log # M17-092

## Microbiology Laboratory Report

**To:** Les Bridwell, Cleaner Solutions LLC  
**From:** Daniel Price, Ph.D., and Brandi Prestridge  
**Date:** 30 May 2017  
**Re:** ASTM 2149 Test of MICROSTATIC Treated Fabric Samples

### Introduction:

MICROSTATIC treated fabric samples labeled as follows were submitted for antibacterial activity against:

*Escherichia coli* ATCC 25922

*Staphylococcus aureus* ATCC 6538

*Staphylococcus aureus* ATCC 43300 (MRSA)

*Pseudomonas aeruginosa* ATCC 15442

The samples were labeled as follows:

New control towel

Sample #1 Wash test 28/56/83

Sample #2 Wash test 28/56/83

Sample #3 Wash test 28/56/83

### Materials and Methods:

ASTM 2149-12 was used to quantitatively assess the antibacterial activity of these samples. The bacteria species specified for these challenges were: *Escherichia. coli* ATCC 25922, *Staphylococcus aureus* 6538, *Staphylococcus*

# Interface Microbiology Resources

aureus ATCC 43300(MRSA), and Pseudomonas aeruginosa ATCC 15442. The contact time specified was 24 hours.

## Results:

*Escherichia coli* ATCC 25922

Sample	Avg. 24 hr Control CFU	Avg. 24 hr Treated CFU	Log Reduction	Percent Reduction
New control towel	$3.0 \times 10^5$	$<1.0 \times 10^2$	3.50	99.968
Sample #1 Wash test 28/56/83	$3.0 \times 10^5$	$1.0 \times 10^2$	3.48	99.967
Sample #2 Wash test 28/56/83	$3.0 \times 10^5$	$5.92 \times 10^2$	2.71	99.803
Sample #3 Wash test 28/56/83	$3.0 \times 10^5$	$2.0 \times 10^2$	3.20	99.936

# Interface Microbiology Resources

*Staphylococcus aureus* 6538

Sample	Avg. 24 hr Control CFU	Avg. 24 hr Treated CFU	Log Reduction	Percent Reduction
New control towel	$2.0 \times 10^5$	$<1.0 \times 10^2$	3.35	99.95
Sample #1 Wash test 28/56/83	$2.0 \times 10^5$	$1.0 \times 10^2$	3.30	99.95
Sample #2 Wash test 28/56/83	$2.0 \times 10^5$	$2.24 \times 10^2$	2.98	99.89
Sample #3 Wash test 28/56/83	$2.0 \times 10^5$	$2.83 \times 10^2$	2.85	99.86

# Interface Microbiology Resources

*Staphylococcus aureus* ATCC 43300(MRSA)

Sample	Avg. 24 hr Control CFU	Avg. 24 hr Treated CFU	Log Reduction	Percent Reduction
New control towel	$1.0 \times 10^5$	$<1.0 \times 10^2$	3.05	99.91
Sample #1 Wash test 28/56/83	$1.0 \times 10^5$	$6.32 \times 10^2$	2.24	99.43
Sample #2 Wash test 28/56/83	$1.0 \times 10^5$	$4.47 \times 10^2$	2.37	99.57
Sample #3 Wash test 28/56/83	$1.0 \times 10^5$	$5.20 \times 10^2$	2.39	99.59

# Interface Microbiology Resources

*Pseudomonas aeruginosa* ATCC 15442

Sample	Avg. 24 hr Control CFU	Avg. 24 hr Treated CFU	Log Reduction	Percent Reduction
New control towel	$2.0 \times 10^5$	$<1.0 \times 10^2$	3.35	99.95
Sample #1 Wash test 28/56/83	$2.0 \times 10^5$	$1.73 \times 10^2$	3.08	99.91
Sample #2 Wash test 28/56/83	$2.0 \times 10^5$	$1.0 \times 10^2$	3.30	99.95
Sample #3 Wash test 28/56/83	$2.0 \times 10^5$	$1.41 \times 10^2$	3.16	99.93

Formula for Log reduction:

Determine Log ( $x \cdot 10^a$ ) of control samples

Determine Log ( $x \cdot 10^a$ ) of treated samples

Determine geometric mean of control samples:

Log values of control samples:  $b_1, b_2, b_3, \dots, b_n$

Mean =  $(b_1 \cdot b_2 \cdot b_3 \cdot \dots \cdot b_n)^{1/n}$

Determine geometric mean of treated samples:

Log values of treated samples:  $c_1, c_2, c_3, \dots, c_n$

Mean =  $(c_1 \cdot c_2 \cdot c_3 \cdot \dots \cdot c_n)^{1/n}$

# Interface Microbiology Resources

Log reduction= geometric mean of the control samples – geometric mean of the treated samples

Where:

x=value of samples

a=exponent value

b=log value of control samples

c=log value of treated samples

n=number of log values in set

Formula for Percent Reduction:

$$(1-10^{-\log \text{reduction}}) \times 100$$

## Discussion:

All of MICROSTATIC treated control and washed towels demonstrated multiple log reduction of *Escherichia coli*, both species of *Staphylococcus* bacteria and *Pseudomonas aeruginosa* challenge under these test conditions.

All technical content (both written and/or photography) provided in this report is for information purposes only. This technical content **shall not** be used in promotional literature without the express written consent and legal/technical review by Interface, Inc. Microorganisms cited in this report were utilized for the purposes of representing general classes of microorganisms. Data citing inhibition of these microorganisms in this report are not intended to convey health benefits.

Interface is an ISO 9001, 14001 accredited facility.