



An Evaluation of Antimicrobial Activity of an Immobilized Antimicrobial Agent Under  
Dynamic Contact Conditions

April 20, 2017

**Performing Laboratory**

Q Laboratories, Inc.  
1400 Harrison Avenue  
Cincinnati, Ohio 45214

**Project Identification Number**

QL# 311089-A

**REVISED REPORT APRIL 21, 2017**

**Study Sponsor**

Amato Industries  
309 Haviland Mill Rd  
Brookville, MD 20833

## TEST SUMMARY

**TITLE:** An Evaluation of Antimicrobial Activity of an Immobilized Antimicrobial Agent Under Dynamic Contact Conditions.

**STUDY DESIGN:** This study is based on ASTM Committee E35.15 standard test method E2149 "Standard Test Method for Determining the Antimicrobial Activity of Immobilized Antimicrobial Agents Under Dynamic Contact Conditions"

**TEST MATERIALS:** Two test products were received at Q Laboratories, Inc. on 4-3-17:

1. PVHNSW312 New Sheet
2. PSHNP312 Soiled Wash Cloth (Cleaned)  
Linen samples are from Paris Healthcare Laundry, Dubois, PA.  
Processed by Amato Industries with the Cleanovation program developed by Cleaner Solutions, LLC centered around the products Balance and Microstatic.

**SPONSOR:** Amato Industries  
309 Haviland Mill Rd  
Brookville, MD 20833

**CONTACT TIME:** 60 Minutes

**CHALLENGE MICROORGANISMS:** *Escherichia coli* ATCC 25922  
*Staphylococcus aureus* ATCC 6538  
*Pseudomonas aeruginosa* ATCC 15442  
*Staphylococcus aureus* ATCC 43300 (MRSA)

**MEDIA AND REAGENTS:**

1. Plate Count Agar (PCA)
2. Tryptic Soy Broth (TSB)
3. Phosphate Buffered Water (PBW)
4. Tryptic Soy Agar with 5% Sheep Blood (SBA)

**Table 1: Antimicrobial Activity at 60 Minutes (Percent and Log<sub>10</sub> Reduction)**

Sample ID	Units	Inoculum Count CFU/mL	Log <sub>10</sub>				Average Untreated Replicate 60 Min
				Test Replicate A	Test Replicate B	Test Replicate C	
<i>Escherichia coli</i> ATCC 25922							
QL #1	CFU/mL	2.6 x 10 <sup>5</sup>	5.4150	< 10	< 10	< 10	2.1 x 10 <sup>5</sup>
	% reduction			> 99.996	> 99.996	> 99.996	
	Log <sub>10</sub> reduction			> 4.415	> 4.415	> 4.415	
QL #2	CFU/mL	2.6 x 10 <sup>5</sup>	5.4150	< 10	10	10	2.1 x 10 <sup>5</sup>
	% reduction			> 99.996	99.996	99.996	
	Log <sub>10</sub> reduction			> 4.415	4.415	4.415	

**Table 2: Antimicrobial Activity at 60 Minutes (Percent and Log<sub>10</sub> Reduction)**

Sample ID	Units	Inoculum Count CFU/mL	Log <sub>10</sub>				Average Untreated Replicate 60 Min
				Test Replicate A	Test Replicate B	Test Replicate C	
<i>Staphylococcus aureus</i> ATCC 6538							
QL #1	CFU/mL	3.5 x 10 <sup>4</sup>	4.544	< 10	< 10	< 10	3.8 x 10 <sup>4</sup>
	% reduction			> 99.971	> 99.971	> 99.971	
	Log <sub>10</sub> reduction			> 3.544	> 3.544	> 3.544	
QL #2	CFU/mL	3.5 x 10 <sup>4</sup>	4.544	< 10	< 10	< 10	3.8 x 10 <sup>4</sup>
	% reduction			> 99.971	> 99.971	> 99.971	
	Log <sub>10</sub> reduction			> 3.544	> 3.544	> 3.544	

**Table 3: Antimicrobial Activity at 60 Minutes (Percent and Log<sub>10</sub> Reduction)**

Sample ID	Units	Inoculum Count CFU/mL	Log <sub>10</sub>				Average Untreated Replicate 60 Min
				Test Replicate A	Test Replicate B	Test Replicate C	
<i>Pseudomonas aeruginosa</i> ATCC 15442							
QL #1	CFU/mL	9.8 x 10 <sup>5</sup>	5.991	< 10	< 10	< 10	7.5 x 10 <sup>5</sup>
	% reduction			> 99.999	> 99.999	> 99.999	
	Log <sub>10</sub> reduction			> 4.991	> 4.991	> 4.991	
QL #2	CFU/mL	9.8 x 10 <sup>5</sup>	5.991	10	< 10	20	7.5 x 10 <sup>5</sup>
	% reduction			99.999	> 99.999	99.997	
	Log <sub>10</sub> reduction			4.991	> 4.991	4.690	

**Table 4: Antimicrobial Activity at 60 Minutes (Percent and Log<sub>10</sub> Reduction)**

Sample ID	Units	Inoculum Count CFU/mL	Log <sub>10</sub>				Average Untreated Replicate 60 Min
				Test Replicate A	Test Replicate B	Test Replicate C	
<i>Staphylococcus aureus</i> MRSA ATCC 43300							
QL #1	CFU/mL	2.8 x 10 <sup>4</sup>	4.447	< 10	< 10	< 10	3.9 x 10 <sup>4</sup>
	% reduction			> 99.964	> 99.964	> 99.964	
	Log <sub>10</sub> reduction			> 3.447	> 3.447	> 3.447	
QL #2	CFU/mL	2.8 x 10 <sup>4</sup>	4.447	< 10	< 10	< 10	3.9 x 10 <sup>4</sup>
	% reduction			> 99.964	> 99.964	> 99.964	
	Log <sub>10</sub> reduction			> 3.447	> 3.447	> 3.447	