



NON-GLP STUDY REPORT

STUDY TITLE

Time Kill Assay for Antimicrobial Agents

Test Organisms:

Carbapenem Resistant *Escherichia coli* (CDC 81371)
Clostridium difficile - spore form (ATCC 43598)
Extended-Spectrum beta-lactamase (ESBL) producing *Klebsiella pneumoniae* (ATCC 700603)
Klebsiella pneumoniae (ATCC 4352)
Staphylococcus aureus (ATCC 6538)
Pseudomonas aeruginosa (ATCC 15442)
Methicillin Resistant *Staphylococcus aureus* - MRSA (ATCC 33592)
Vancomycin Resistant *Enterococcus faecalis* - VRE (ATCC 51575)
Acinetobacter baumannii (ATCC 19606)

PRODUCT IDENTITY

NUTEK OZONE LAUNDRY SUPPORT SYSTEMS™
Manufactured exclusively by Sustainable Solutions, LLC

AUTHOR

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STUDY COMPLETION DATE

July 17, 2018

PERFORMING LABORATORY

Accuratus Lab Services (formerly ATS Labs)
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SPONSOR

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PROJECT NUMBERS

A25618, A10770, A10769, A10768, A10767 and A10719

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STUDY REPORT

GENERAL STUDY INFORMATION

Study Title: Time Kill Assay for Antimicrobial Agents
Project Number: A25618, A10770, A10769, A10768, A10767 and A10719
Protocol Number: NTI01042518.TK, NTI01010411.TK.4, NTI01010411.TK.3, NTI01010411.TK.2, NTI01010411.TK.1 and NTI01122110.TK

TEST SUBSTANCE IDENTITY

Test Substance Name: NuTek's OLSS (Ozone Laundry Support System)

Exclusivity: These test results are exclusively associated with the production of and efficacy of ozone as produced by NuTek's Ozone Laundry Support Systems and tested by Accuratus Lab Services. These results in **no way** represent the efficacy of any other Ozone Laundry System, intended for use in a commercial or On Premises Laundry.

Test Organism	Designation #	Growth Medium	Incubation Parameters
Carbapenem Resistant <i>Escherichia coli</i>	81371	Tryptic Soy Agar + 5% Sheep's Blood	35-37°C, aerobic
Extended-Spectrum beta-lactamase (ESBL) producing <i>Klebsiella pneumoniae</i>	700603		
<i>Klebsiella pneumoniae</i>	4352		
<i>Staphylococcus aureus</i>	6538		
<i>Pseudomonas aeruginosa</i>	15442		
Methicillin Resistant <i>Staphylococcus aureus</i> - MRSA	33592		
Vancomycin Resistant <i>Enterococcus faecalis</i> - VRE	51575		
<i>Acinetobacter baumannii</i>	19606		
<i>Clostridium difficile</i> - spore form	43598	CDC Anaerobic Blood Agar	35-37°C, anaerobic

The test organisms used in this study were obtained from the American Type Culture Collection (ATCC), Manassas, VA or Centers for Disease Control and Prevention (CDC) Atlanta, Georgia.

Recovery Media

Neutralizer: Lethen Broth + 1.0% Sodium Thiosulfate
Agar Plate Medium: Tryptic Soy Agar with 5% Sheep Blood (BAP) or BHIY-HT

Exposure Times: 3 minute, 5 minute, 10 minutes
Exposure Temperature: Room Temperature (20-21°C)
Soil Load Description: No organic soil load required
Preparation: Test Substance was prepared using Sponsor provided device attached to Accuratus Lab Services tap water

CONTROL RESULTS

All controls including culture purity, neutralizer sterility, test population, spore verification and neutralization confirmation were all acceptable.

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ANALYSIS

When tested at room temperature (20-21°C) under the conditions of each study:

OLSS demonstrated >99.999% (>5.26 Log₁₀) reduction of Extended-Spectrum beta-lactamase (ESBL) Carbapenem Resistant *Escherichia coli* (ATCC 81371) survivors after 3 minute, 5 minute and 10 minute exposure times.

OLSS demonstrated >99.999% (>5.48 Log₁₀) reduction of Extended-Spectrum beta-lactamase (ESBL) producing *Klebsiella pneumoniae* (ATCC 700603) survivors after 3 minute, 5 minute and 10 minute exposure times.

OLSS demonstrated >99.999% (>5.3 Log₁₀) reduction of *Klebsiella pneumoniae* (ATCC 4352) survivors after 3 minute, 5 minute and 10 minute exposure times.

OLSS demonstrated >99.999% (>5.7 Log₁₀) reduction of *Staphylococcus aureus* (ATCC 6538) survivors after 3 minute, 5 minute and 10 minute exposure times.

OLSS demonstrated >99.999% (>5.1 Log₁₀) reduction of *Pseudomonas aeruginosa* (ATCC 15442) survivors after 3 minute, 5 minute and 10 minute exposure times.


OLSS demonstrated >99.999% (>5.4 Log₁₀) reduction of Methicillin Resistant *Staphylococcus aureus* - MRSA (ATCC 33592) survivors after 3 minute, 5 minute and 10 minute exposure times.

OLSS demonstrated >99.999% (>5.3 Log₁₀) reduction of Vancomycin Resistant *Enterococcus faecalis* - VRE (ATCC 51575) survivors after 3 minute, 5 minute and 10 minute exposure times.

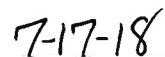
OLSS demonstrated >99.999% (>5.0 Log₁₀) reduction of *Acinetobacter baumannii* (ATCC 19606) survivors after 3 minute, 5 minute and 10 minute exposure times.

OLSS in combination with approximately 125 ppm commercial strength sodium hypochlorite (chlorine bleach), as a typical chemical companion in the laundry process, demonstrated >99.999% (>5.38 Log₁₀) reduction of *Clostridium difficile* - spore form (ATCC 43598) survivors after 3 minute, 5 minute and 10 minute exposure times.

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Date

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