FINAL REPORT

PROTOCOL
Efficacy Testing of a UV-Light Disinfection Device

PRODUCT TESTED
A.I.R. Industries UV Device

EMSL ORDER NUMBER
152006380

TESTING LABORATORY
EMSL Analytical, Inc.
5950 Fairbanks North Houston Rd.
Houston TX 77040
Phone: (713) 686-3635
Web: www.emsl.com

SPONSOR
A.I.R. Industries
4401 Division St.
Metarie, LA 70002

STUDY START DATE
September 29, 2020

STUDY COMPLETION DATE
October 13, 2020

Test Summary

Project Title: Efficacy Testing of a UV-C Light Disinfection System

Study Methods: ASTM E3135 Standard Practice for Determining Antimicrobial Efficacy of Ultraviolet Germicidal Irradiation Against Microorganisms on Carriers with Simulated Soil.

Product Tested: A.I.R. Industries UV device

Sponsor: A.I.R. Industries

Test Conditions: Ambient room temperature

Challenge Organisms: *Staphylococcus aureus* (*S. aureus*) - ATCC 6538
Escherichia coli (*E. coli*) - ATCC 25922

Exposure Times: 0 and 5 minutes

Study Dates and Facilities

All analytical testing was performed at EMSL Analytical, Inc. in Houston, Texas from date 09/29/2020 to 10/13/2020.

Record Retention

All raw data and a copy of the final report will be archived and stored by EMSL Analytical, Inc. for 5 years.

Objectives

To determine the antibacterial efficacy of a UV-C light disinfection device against *S. aureus* and *E. coli* on surgical mask material after 5 minutes of contact time at room temperature.

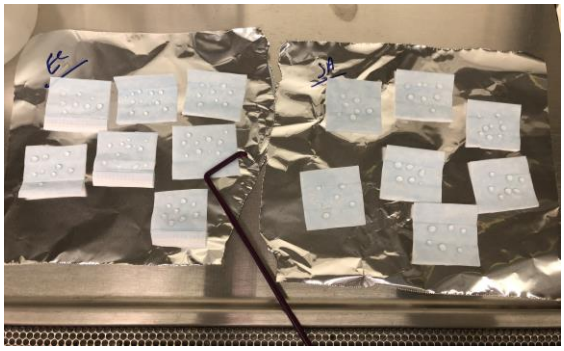
Test Method

Inoculum Preparation

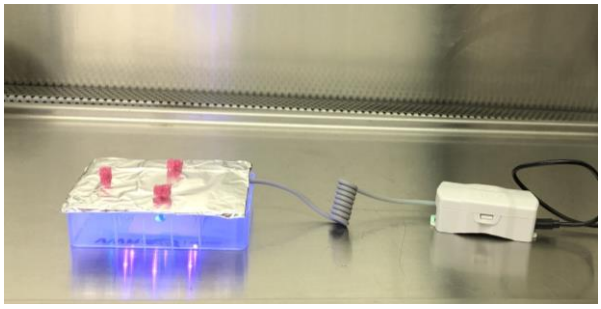
Bacteria from pure stock cultures were grown separately onto tryptic soy agar supplemented with 5% sheep blood (TSAB) and incubated at 36±1°C for 24 hours. The cultures were used to harvest colonies which were suspended into 10 mL of 10% tryptic soy broth (TSB). These suspensions were used to inoculate the test surfaces.

Procedure

Blue-white surgical masks were cut down to 2x2 inch test samples and inoculated with 200 µL of the microbial suspension. The samples were then allowed to air dry at room temperature inside a biosafety cabinet for ~90 minutes (pic 1). Inoculated test samples were placed under the UV light device set at a distance of 1 inch above and subjected to 5 minutes of UV light (Pic 2).



Pic 1. Mask test samples being prepared in a biosafety cabinet.



Pic 2. The test samples were placed under the device at a 1 inch distance and exposed to the UV light for 5 minutes.

After the exposure, the test samples were placed into centrifuge tubes with sterile buffer water and vortexed to recover any remaining microbes. The recovered microbes were serially diluted, plated onto Petrifilm AC plates and incubated for 24-48 hours at 36±1°C. All tests were performed in triplicate including controls (untreated samples) to determine the starting microbial populations on the test materials.

Experimental Results:

Table 1. Efficacy of UV- C device against *S. aureus*.

Sample	Treatment	UV-light Exposure (minutes)	Bacterial Recovery CFU/Test Surface (average of 3 surfaces)	Log Reduction	Percent Reduction
Control	Untreated	0	3,590,000		
Test 1	Treated	5	<100	>4.56	>99.997

Table 2. Efficacy of UV- C device against *E. coli*.

Sample	Treatment	UV-light Exposure (minutes)	Bacterial Recovery CFU/Test Surface (average of 3 surfaces)	Log Reduction	Percent Reduction
Control	Untreated	0	4,440,000		
Test 1	Treated	5	470	3.98	99.99

Conclusions:

The UV light device submitted by A.I.R. Industries effectively reduced the bacterial contaminates after 5 minutes of UV treatment with a percent reduction of >99.997% against *S. aureus* and 99.99% against *E. coli.*

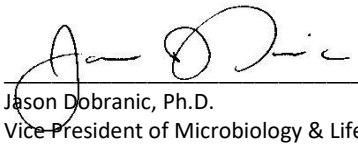
Signatures

Study Performed by:

Mona Ramadi, Ph.D.
Microbiologist

10/13/2020
Date

Report Issued by:



Jason Dobranic, Ph.D.
Vice President of Microbiology & Life Sciences
Study Director

10/13/2020
Date