Analysis Report

Twin Arbor Analytical

3990 Ruth Way Suite D

Paso Robles, CA 93446

Applicant: Kapsule UV-C Sanitizer

Laboratory ID: 200626-127-1

Sample Description:

Item Name: UV-C Sanitizing Smartphone Case

Tests Conducted:

Tested Sample: Tested systems reported efficacy claim

Standard: ASTM E3135-18 Standard Practice for Determining Antimicrobial Efficacy of Ultraviolet Germicidal Irradiation Against Microorganisms on Carriers Using a Time-Kill Procedure

Results:

Assessment efficacy criteria was meet. See attached page(s) for test result assessment values

Prepared and Checked By:

Twin Arbor Analytical

Shawn Richmond

Microbial Laboratory Director

Authorized By:

Twin Arbor Analytical

Savannah Perez

Quality Control Manager

Test Conditions

Exposure time points:	1min ± 5s
	3min ± 5s
	5min ± 5s
Test temperature:	(20 ± 2) ℃
Incubation:	(32.5 ± 2) ℃, 24-48 hours
Agar medium:	Brain Heart Infusion Agar, pH 7.4 ± 0.2
Diluent:	Buffered Peptone Water, pH 7.2 ± 0.2
Test culture:	*Escherichia coli* (ATCC 8739)
	Salmonella typhimurium (ATCC 13311)
	Listeria monocytogenes (ATCC 19111)
Culture suspension:	10uL of initial culture suspension was added to a glass carrier and dried for 10-15min prior to exposure time points. Cells were recovered by vortexing the glass carriers in the diluent for 20 minutes and then immediately plated for colony counts.
Log_{10} reduction criteria:	$R \geq 3.0$
% reduction criteria:	≥ 99.9

Results

Test microorganisms	Initial culture suspension count (cfu/ml)	Positive control recovered count** (cfu/ml)	1 min exposure average recovered count (cfu/ml)	3 min exposure average recovered count (cfu/ml)	5 min exposure average recovered count (cfu/ml)	Log_{10} Reduction*	% Reduction*
Escherichia coli (ATCC 8739)	1.2×10^8	4.6×10^4	15	<10	<10	>3.0	>99.9%
Salmonella typhimurium (ATCC 13311)	5.3×10^8	1.7×10^6	685	<10	<10	>4.0	>99.99%
Listeria monocytogenes (ATCC 19111)	4.3×10^8	9.9×10^5	2780	145	<10	>5.0	>99.999%

*reported values are for the longest exposure time point

**the positive control was subjected to the same drying time and vortexing, but did not receive any UV-C exposure.

End of Report

Analysis Report

Twin Arbor Analytical

3990 Ruth Way Suite D

Paso Robles, CA 93446

Applicant: Kapsule UV-C Sanitizing

Laboratory ID: 200626-127-2

Sample Description:

Item Name: UV-C Sanitizing Portable Wand 2.0

Tests Conducted:

Tested Sample: Tested systems reported efficacy claim

Standard: ASTM E3135-18 Standard Practice for Determining Antimicrobial Efficacy of Ultraviolet Germicidal Irradiation Against Microorganisms on Carriers Using a Time-Kill Procedure

Results:

Assessment efficacy criteria was meet. See attached page(s) for test result assessment values

Prepared and Checked By:

Twin Arbor Analytical

Shawn Richmond

Microbial Laboratory Director

Authorized By:

Twin Arbor Analytical

Savannah Perez

Quality Control Manager

Test Conditions

Exposure time points:	15s ± 5s
	30s ± 5s
	1min ± 5s
Test temperature:	(20 ± 2) ℃
Incubation:	(32.5 ± 2) ℃, 24-48 hours
Agar medium:	Brain Heart Infusion Agar, pH 7.4 ± 0.2
Diluent:	Buffered Peptone Water, pH 7.2 ± 0.2
Test culture:	*Escherichia coli* (ATCC 8739)
	Salmonella typhimurium (ATCC 13311)
	Listeria monocytogenes (ATCC 19111)
Culture suspension:	10uL of initial culture suspension was added to a glass carrier and dried for 10-15min prior to exposure time points. Cells were recovered by vortexing the glass carriers in the diluent for 20 minutes and then immediately plated for colony counts.
Log_{10} reduction criteria:	$R \geq 3.0$
% reduction criteria:	≥ 99.9

Results

Test microorganisms	Initial culture suspension count (cfu/ml)	Positive control recovered count** (cfu/ml)	15s exposure average recovered count (cfu/ml)	30s exposure average recovered count (cfu/ml)	1 min exposure average recovered count (cfu/ml)	Log_{10} Reduction*	% Reduction*
Escherichia coli (ATCC 8739)	1.2×10^8	4.6×10^4	<10	<10	<10	>3.0	>99.9%
Salmonella typhimurium (ATCC 13311)	5.3×10^8	1.7×10^6	<10	<10	<10	>4.0	>99.99%
Listeria monocytogenes (ATCC 19111)	4.3×10^8	9.9×10^5	175	<10	<10	>5.0	>99.999%

*reported values are for the longest exposure time point

**the positive control was subjected to the same drying time and vortexing, but did not receive any UV-C exposure.

End of Report

Analysis Report

Twin Arbor Analytical

3990 Ruth Way Suite D

Paso Robles, CA 93446

Applicant: Kapsule UV-C Sanitizing

Laboratory ID: 200626-127-3

Sample Description:

Item Name: UV-C Sanitizing Tower

Tests Conducted:

Tested Sample: Tested systems reported efficacy claim

Standard: ASTM E3135-18 Standard Practice for Determining Antimicrobial Efficacy of Ultraviolet Germicidal Irradiation Against Microorganisms on Carriers Using a Time-Kill Procedure

Results:

Assessment efficacy criteria was meet. See attached page(s) for test result assessment values

Prepared and Checked By:

Twin Arbor Analytical

Shawn Richmond

Shawn Richmond

Microbial Laboratory Director

Authorized By:

Twin Arbor Analytical

Savannah Perez

Quality Control Manager

Test Conditions

Exposure time points:	1min ± 5s
	5min ± 5s
	15min ± 5s
Test temperature:	(20 ± 2) ℃
Incubation:	(32.5 ± 2) ℃, 24-48 hours
Agar medium:	Brain Heart Infusion Agar, pH 7.4 ± 0.2
Diluent:	Buffered Peptone Water, pH 7.2 ± 0.2
Test culture:	*Escherichia coli* (ATCC 8739)
	Salmonella typhimurium (ATCC 13311)
	Listeria monocytogenes (ATCC 19111)
Culture suspension:	10uL of initial culture suspension was added to a glass carrier and dried for 10-15min prior to exposure time points. Cells were recovered by vortexing the glass carriers in the diluent for 20 minutes and then immediately plated for colony counts.
Log_{10} reduction criteria:	$R \geq 3.0$
% reduction criteria:	≥ 99.9

Results

Test microorganisms	Initial culture suspension count (cfu/ml)	Positive control recovered count** (cfu/ml)	1 min exposure average recovered count (cfu/ml)	5 min exposure average recovered count (cfu/ml)	15 min exposure average recovered count*** (cfu/ml)	Log_{10} Reduction*	% Reduction*
Escherichia coli (ATCC 8739)	2.9×10^7	2.9×10^4	315	190	<10	>3.0	>99.9%
Salmonella typhimurium (ATCC 13311)	1.7×10^8	6.5×10^4	32000	795	<10	>3.0	>99.9%
Listeria monocytogenes (ATCC 19111)	3.7×10^8	8.0×10^5	21820	1060	60	>4.0	>99.99%

*reported values are for the longest exposure time point
**the positive control was subjected to the same drying time and vortexing, but did not receive any UV-C exposure.
***_Listeria monocytogenes_ 15 min exposure value is based on 1 replicate in full UV-C exposure.

End of Report