intertek
Total Quality. Assured.

MAINSTREAM ENGINEERING CORP

EFFICACY TEST REPORT

SCOPE OF WORK
Non-standardized Test Method: Microbial Reduction Rate Test

PRODUCT – Air Purifier

MODEL – QwikPure TripleGuard

REPORT NUMBER
104437224COL-002

ISSUE DATE
12/07/20

PAGES 7

DOCUMENT CONTROL NUMBER
GFT-OP-10h (6-July-2017)

SECTION 1 EFFICACY STUDY SUMMARY

Client		**Mainstream Engineering Corporation 200 Yellow Place Pines Industrial Center Rockledge, FL 32955-5327 USA**
Project No.		G104437224
Sample	Product	Air Purifier
	Model	QwikPure TripleGuard
Procedural	Engineer	Amanda Mastronicolas
	Reviewer	Nicholas Unger
	Dates Tested	11/12/20 – 11/23/20
	Report Date	11/24/2020
Standard	Non-standardized Test Method: Microbial Reduction Rate Test	
Testing Facility	Intertek Microbiological Laboratory 1717 Arlingate Ln. Columbus, OH 43228 United States	

SECTION 2 TEST PROCEDURE

The test chamber measured 10'x10'x10' (1000 cubic ft) room and a microbial suspension was aspirated into the chamber. Air samples were taken from the test chamber once the unit was turned on and sampling was taken every 5 minutes over a period of 15 minutes, then every 15 minutes until the 1 hour mark was reached, and finally every 30 minutes until the 2 hour mark was reached and then plated. The process was then repeated without the test unit in the chamber to provide the natural decay results. All plates were incubated overnight and viral growth on the test plate was compared to that of the natural decay control. Testing was completed in triplicate and results presented represent the average results of all test runs.

The unit was placed inside a duct that measured 14 inch by 16 inch and 48" long and placed on a small table in the center of the room approximately 3 feet off the ground.

Air sampling took place using an SKC BioStage Single-stage impactor for 30 seconds at 12L/min (.424 cubic feet/min). Results below represent the percent reduction at 120 minutes.

SECTION 3 ORGANISMS

Organism Name	Organism Type	ATCC Number	Source
Phi X174 bacteriophage	small, non-enveloped virus	13706-B1	Carolina Bioscience
Escherichia coli	Bacteria	11229	ATCC

SECTION 3 EQUIPMENT

Equipment Type	Equipment No.	Calibration Due Date
Micropipette	CE 2587	6/12/2021
Incubator	CE 2381	7/7/2021
Balance	CE 1882	7/7/2021
Autoclave	CE 2376	Verify Before Use
Centrifuge	CE 2382	For Reference Only
Chamber	CE 1149	For Reference Only
Collision Nebulizer	CE 1139	For Reference Only
Refrigerator	CE 1157	For Reference Only
Pump	CE 1137	For Reference Only
Stopwatch	SW013	07/07/2021
Ambient Temperature/RH	CE 1179	For Reference Only

SECTION 4 MEDIA AND REAGENTS

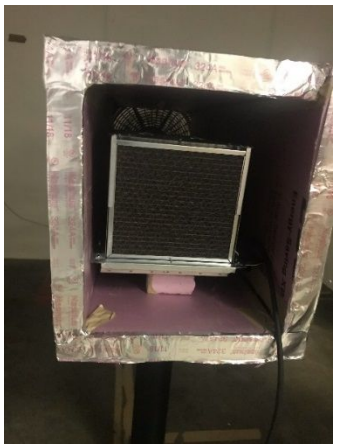
Type	Manufacturer	Lot No	Expiration Date
Nutrient Agar	DIFCO	9346039	10/31/2024
PBS	Fisher	192736	08/01/2022

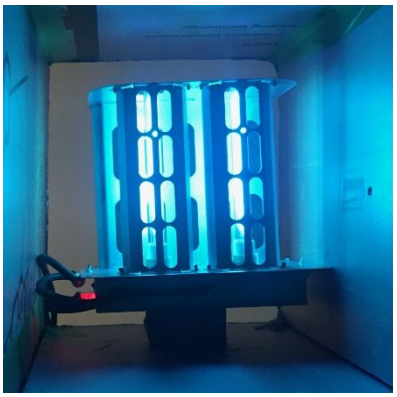
SECTION 5 SAMPLE ACQUISITION

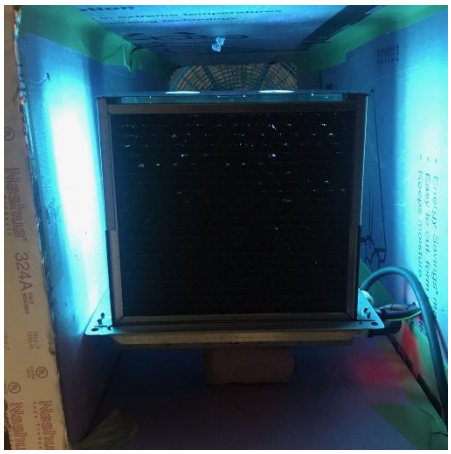
Acquisition method	Shipped to Intertek
Description	Industrial grade air purifier/ sanitizer
Model Number	QT2730
Arrival date	09/22/2020
Condition	New
Sample Identification No.	COL2009221336-001
Development Level	Production

SECTION 6 SUMMARY OF RESULTS

Fan Speed
800 CFM







Organism Type	Virus	Bacteria
Temperature Min/Max	18°C (64°F) / 19°C (66°F)	
Humidity Min/Max	33 % RH / 35% RH	
Organism Name	*Phi-X174*	*E. coli*
Average Percent Reduction (N=3)	99.9%	99.9%

Completed by:	Amanda Mastronicolas	Reviewed by:	Nicholas Unger
Title:	Microbiology Tech I	Title:	Staff Engineer
Signature:		Signature	
Date	07-DEC-2020	Date:	07-DEC-2020

Annex A Test Results:

Test Parameter		Test Result	Natural Decay Result	Units
Organism	Species	*Coliphage φX174*		---
	ATCC No.	13706-B1		---
	Challenge Concentration	5.0×10^9		PFU/mL
Samples (10min.)	0	TNTC	TNTC (2628)	PFU
	5	TNTC	TNTC (2628)	PFU
	10	TNTC	TNTC (2628)	PFU
	15	TNTC	TNTC (2628)	PFU
	30	133	TNTC (2628)	PFU
	45	15	TNTC (2628)	PFU
	60	2	TNTC (2628)	PFU
	90	<1	TNTC (2628)	PFU
	120	<1	TNTC (2628)	PFU
Results	--	99.9%		Reduction

Test Parameter		Test Result	Natural Decay Result	Units
Organism	Species	*Coliphage φX174*		---
	ATCC No.	13706-B1		---
	Challenge Concentration	5.0×10^9		PFU/mL
Samples (10min.)	0	TNTC	TNTC (2628)	PFU
	5	TNTC	TNTC (2628)	PFU
	10	TNTC	TNTC (2628)	PFU
	15	TNTC	TNTC (2628)	PFU
	30	140	TNTC (2628)	PFU
	45	30	TNTC (2628)	PFU
	60	5	TNTC (2628)	PFU
	90	<1	TNTC (2628)	PFU
	120	<1	TNTC (2628)	PFU
Results	--	99.9%		Reduction

Test Parameter		Test Result	Natural Decay Result	Units
Organism	Species	*Coliphage φX174*		---
	ATCC No.	13706-B1		---
	Challenge Concentration	5.0×10^9		PFU/mL
Samples (10min.)	0	TNTC	TNTC (2628)	PFU
	5	TNTC	TNTC (2628)	PFU
	10	TNTC	TNTC (2628)	PFU
	15	TNTC	TNTC (2628)	PFU
	30	119	TNTC (2628)	PFU
	45	17	TNTC (2628)	PFU
	60	<1	TNTC (2628)	PFU
	90	<1	TNTC (2628)	PFU
	120	<1	TNTC (2628)	PFU
Results	--	99.9%		Reduction

Test Parameter		Test Result	Natural Decay Result	Units
Organism	Species	*E.coli*		---
	ATCC No.	11229		---
	Challenge Concentration	8.8×10^8		CFU/mL
Samples (10min.)	0	TNTC	TNTC (2628)	CFU
	5	TNTC	TNTC (2628)	CFU
	10	112	TNTC (2628)	CFU
	15	5	TNTC (2628)	CFU
	30	1	TNTC (2628)	CFU
	45	<1	TNTC (2628)	CFU
	60	<1	TNTC (2628)	CFU
	90	<1	TNTC (2628)	CFU
	120	<1	TNTC (2628)	CFU
Results	--	99.9%		Reduction

Test Parameter		Test Result	Natural Decay Result	Units
Organism	Species	*E.coli*		---
	ATCC No.	11229		---
	Challenge Concentration	8.8×10^8		CFU/mL
Samples (10min.)	0	TNTC	TNTC (2628)	CFU
	5	TNTC	TNTC (2628)	CFU
	10	103	TNTC (2628)	CFU
	15	26	TNTC (2628)	CFU
	30	3	TNTC (2628)	CFU
	45	<1	TNTC (2628)	CFU
	60	<1	TNTC (2628)	CFU
	90	<1	TNTC (2628)	CFU
	120	<1	TNTC (2628)	CFU
Results	--	99.9%		Reduction

Test Parameter		Test Result	Natural Decay Result	Units
Organism	Species	*E.coli*		---
	ATCC No.	11229		---
	Challenge Concentration	8.8×10^8		CFU/mL
Samples (10min.)	0	TNTC	TNTC (2628)	CFU
	5	TNTC	TNTC (2628)	CFU
	10	106	TNTC (2628)	CFU
	15	9	TNTC (2628)	CFU
	30	4	TNTC (2628)	CFU
	45	<1	TNTC (2628)	CFU
	60	<1	TNTC (2628)	CFU
	90	<1	TNTC (2628)	CFU
	120	<1	TNTC (2628)	CFU
Results	--	99.9%		Reduction