NOOR TECHNOLOGIES
TEST LABORATORIES

Study Title

Antibacterial Activity and Efficacy Evaluation of UVC Cleaning System's UV Device

Test Method

Effectiveness of Recommended Disinfectants for Ambient Air

Study Identification Number

NL2020-A-2512

Researchers

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History of laboratory

Antimicrobial Test Laboratories was launched in 2020 to provide testing services to the antimicrobial industry. The company has grown considerably since then but its focus remains the same: Test antimicrobial agents, test them well, and test themfast! Antimicrobial Test Laboratories operates a 1,000+ square foot facility in Istanbul, Turkey, where hundreds of studies are conducted annually by a staff of friendly, knowledgeable, and experienced microbiologists.

Laboratory Qualification Statement

The laboratory ensures consistent, reproducible results by utilizing a well-trained and educated scientific staff who work from a comprehensive system of Standard Operating Procedures, official standard methods from ASTM, AOAC, and other organizations, and custom study protocols.

Test Device Information

	New system
	92x92x25.4 mm fan
	The amount of air it draws in an hour is 100,241 m3.
	Operating voltage is 12V.
	Current 0,32 A.
	Power 3.84 W.
	Turnover rate 3000 RPM
	Noise 36 dbA

New System: The fan type used in 160-millimeter diameter sconce is 92x92x25.4 mm fan. The amount of air drawn by this fan is 100,241 m^3 per hour.

The diameter of the pipe was calculated as 168 mm in the old sconce area calculation. The sconce diameter for the new fan was calculated as 160 mm.

PICTURE OF DEVICE

Test Microorganism Information

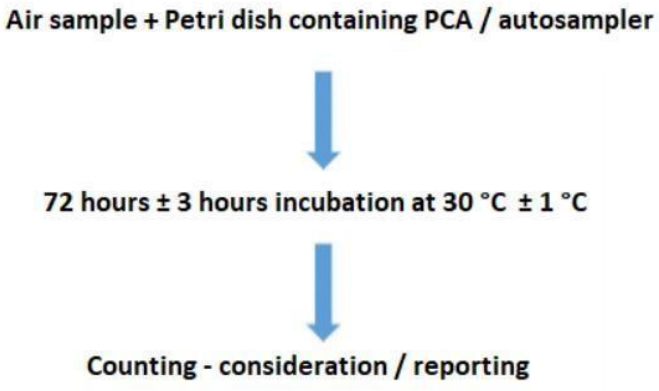
Test microorganisms selected for this test:
Total Aerobic Mesophilic Bacteria from the Environment
It is one of the most common analysis methods used.
Since no single medium and incubation conditions can provide the environment where all existing microorganisms can grow, only the microorganism group that can grow under the specified conditions can be determined.
Except for those responsible for the laboratory, microorganisms should not be touched or entered into the laboratory environment. It is especially dangerous for children, pregnant women and people with chronic conditions.

Summary of the Procedure

Plate Count Agar (PCA), which is brought to a temperature of ~ 45 ° C, is poured approximately 15 ml into petri dishes (pouring sowing method) and immediately moved by drawing the petri dish 8 on the bench. Thus, the medium is mixed homogeneously. This process should be done within 45 minutes at the latest after the plates are inoculated.

If any microorganism covering the surface of the medium is observed in suspicious situations after solidification is completed, 4 ml of Overlay Medium, heated to ~ 45 ° C, is poured on each plate to cover the surface. Petri dishes are left to incubate for 72 ± 3 hours at 30 ± 1 ° C by inverting.

Study Timeline



Criteria for Scientific Defensibility of a Custom Device Study

For Antimicrobial Test Laboratories to consider a Device Studystudy to be scientifically defensible, the following criteria must be met:

1. The average number of viable bacteria recovered from the time zero samples must be approximately 1 x 105 cells/carrier or greater.
2. Positive/Growth controls must demonstrate growth of the appropriate test microorganism.
3. Negative/Purity controls must demonstrate no growth of test microorganism.

Passing Criteria

Because of the nature of the study, passing criteria may be determined by the Study Sponsor.

Testing Parameters used in this Study

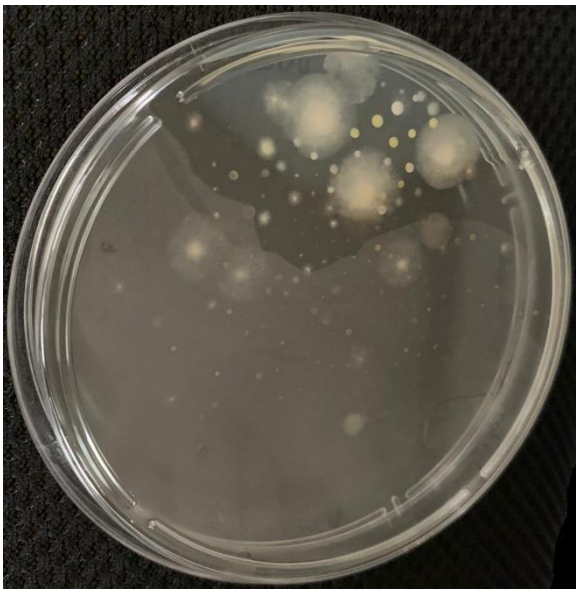
Carrier (Size):	Stainless Steel (1” x 3”)
Replicates:	See Data
Culture Dilution Media:	Sterile Reverse Osmosis (R/O) Water
Culture Supplement:	5% FBS
Inoculum Target:	1.0 x 107 CFU/Carrier
Inoculum Volume:	0.01 ml
Inoculum SurfaceArea:	10 cm2
Carrier Dry Time:	10 Minutes
Carrier Dry Temperature:	Ambient (23±2oC)
Contact Time(s):	See Data
Contact Distance(s):	See Data
Contact Temperature:	Ambient (23±2oC)
Neutralizer (Vol.):	D/E Broth (20 ml)
Enumeration Media, Method:	PCA/Total creature
Enum. Media Supplement:	N/A
Enum. Plate Incubation Temp.:	30°C ± 1°C
Enum. Plate Incubation Time:	48-72 hours
Enum. Plate Incubation	Aerobic

Study Notes

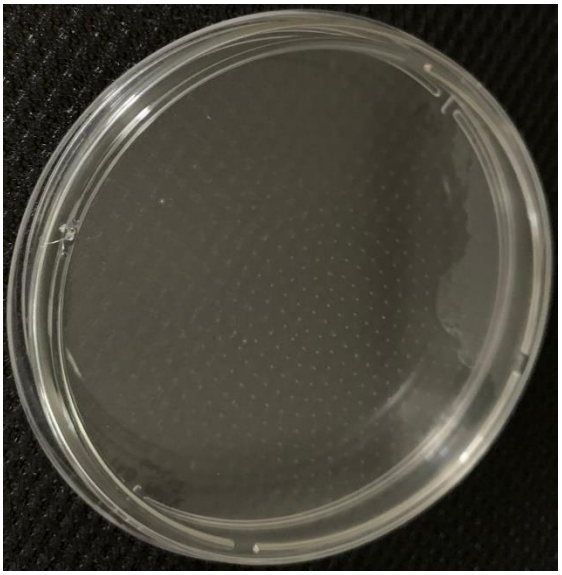
Test Room Dimensions: 3.45 m X 6.8 m X 2.99 m

PHOTOS

Images before UV-C sterilization



Images after UV-C sterilization



Control Results

Neutralization Method:D/E(20ml)Vortex
Media Sterility: Sterile
Growth Confirmation: Colony Morphology
Antibiotic Resist. N/A

Calculations

$$\text{Percent Reduction} = \left(\frac{B - A}{B}\right) \times 100$$

Where:
B = Average number of viable test microorganisms on the control carriers
A = Number of viable test microorganisms on the test carriers after the contact time

$$\text{Log}_{10}\text{Reduction} = \text{Log}\left(\frac{B}{A}\right)$$

Where:
B = Average number of viable test microorganisms on the control carriers.
A = Number of viable test microorganisms on the test carriers after the contact time

RESULTS

Test Microorganism	Device	Contact Time	Contact Distance	% Reduction vs Numbers Control	Log_{10} Reduction vs Numbers Control
Total aerobic mesophilic bacteria	Air Sterilization Device	Numbers Control		N/A	
		1 Hour	100 cm (under)	> 92.5 %	> 1.125
			70 cm (top)	> 92.5 %	> 1.125

Test Microorganism	Device	Contact Time	Contact Distance	% Reduction vs Numbers Control	Log_{10} Reduction vs Numbers Control
Total aerobic mesophilic bacteria	Air Sterilization Device	Numbers Control		N/A	
		1 Hour	100 cm (under)	> 96.92 %	> 1.512
			70 cm (top)	> 96.92 %	> 1.512

The results of this study apply to the tested substances(s) only. Extrapolation of findings to related materials is the responsibility of the Sponsor.