



中国认可  
国际互认  
检测  
TESTING  
CNAS L0823

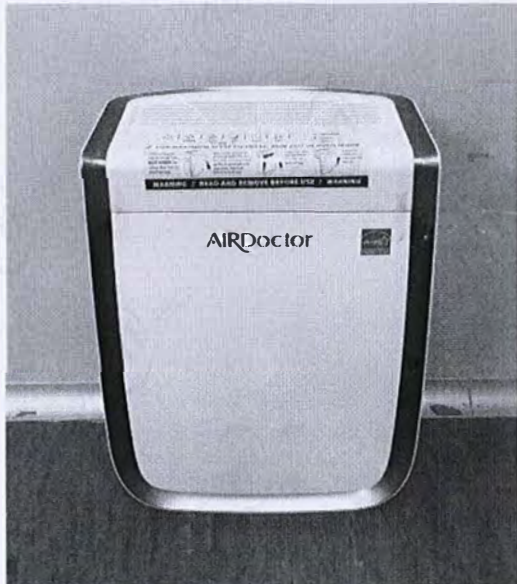


Test No. KJ20201603

**GUANG ZHOU INSTITUTE OF MICROBIOLOGY**  
**TEST REPORT**

Date Received: Apr. 08, 2020

Date Analyzed: Apr. 09, 2020

Name of Sample	Air Purifier	Source of Sample	Delivery
Applicant	Air Doctor LLC	Client	Sherry Huang
Manufacturer	—	Brand	AirDoctor
Type and Specification	AD3000	Quantity of Sample	1 Set (Two machines and a set of filters)
Date of Production	---	State of Sample	Machine
Batch Number	---	Packing of Sample	In box
Sample Picture			
Standard and Methods	GB 21551.3-2010 Antibacterial and cleaning function for household and similar electrical appliances-Particular requirements of air cleaner		
Items of Analysis	1. Eliminating Bacterial Rate ( <i>Staphylococcus albus</i> 8032, <i>Staphylococcus aureus</i> ATCC 6538, <i>Escherichia coli</i> 8099, <i>Klebsiella pneumoniae</i> ATCC 4352, <i>Serratia marcescens</i> ATCC 14041, <i>P.Aeruginosa</i> ATCC 15442, <i>Candida albicans</i> ATCC 10231, <i>Aspergillus niger</i> ATCC 16404) 2. *Virus removal Rate ( <i>E. Coli Phage Phi-X174</i> )		
Remarks	---		

\*\*\*To be continued\*\*\*



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**Test Method for Air Purifier Disinfection Performance:**

1. Test Equipment

- 1) Strain: *Staphylococcus albus*, *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella pneumoniae*, *Serratia marcescens*, *P.Aeruginosa*, *Candida albicans*
- 2) Microbial aerosol generator: TK-3
- 3) Culture media: NA, SDA
- 4) Sampling equipment: six-stage sieve sampler

2. Test Conditions

- 1) The volume of the test chamber: 30 m<sup>3</sup>
- 2) Environment temperature: (20~25) °C
- 3) Environment humidity: (50~70) %RH

3. Operation Conditions of the Air Purifier

Set the switch to position "The highest wind speed", "negative ions".

4. Test Procedure

- 1) Get a slant culture (4~5 generation) which is incubated at 37 °C for 24 h, wash the culture from this slant with 10 mL broth, filter the liquid culture by aseptic cotton buds, and dilute this inoculums with broth as appropriate.
- 2) The equipments are placed in the test chambers, close the door, and turn on the HEPA filter system. Simultaneously operate the environmental control devices until the temperature reaches (20~25)°C, relative humidity reaches (50~70)%. Turn off the chamber environmental control system.
- 3) Release microbial aerosol: turn on the microbial aerosol generator, then turn on the ceiling fan, turn off the fan after 10 min, and let stand for 15 min.
- 4) Original bacteria aerosols collected by six-stage sieve sampler.
- 5) The air purifier is adjusted to the highest air cleaning mode setting for test (test group). Bacteria aerosols (control group and test group) are collected at 60 min .
- 6) Choose 2 NA plates (the same batch) as the negative control, and culture them on the same condition with the samples.
- 7) Run the test three times and take the mean as the final result.

5. Computational Formula

$$\text{Natural decay rate } N_t(\%) = \frac{V_0 - V_t}{V_0} \times 100$$

Where:  $V_0$  = original bacteria count of control group;  $V_t$  = bacteria count after treatment of control group.

$$\text{Eliminating Bacterial Rate } K_t(\%) = \frac{V_1 \times (1 - N_t) - V_2}{V_1 \times (1 - N_t)} \times 100$$

Where:  $V_1$  = original bacteria count of test group;  $V_2$  = bacteria count after treatment of test group.

\*\*\*To be continued\*\*\*



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Test results

Number of Sample	Test Time (min)	Test Bacteria	Test Number	Control Group			Test Group		Eliminating Bacterial Rate $K_t$ (%)				
				Original Bacteria Count $V_0$ (cfu/m <sup>3</sup> )	Bacteria Count after Treatment $V_t$ (cfu/m <sup>3</sup> )	Natural Decay Rate $N_t$ (%)	Original Bacteria Count $V_1$ (cfu/m <sup>3</sup> )	Bacteria Count after Treatment $V_2$ (cfu/m <sup>3</sup> )					
KJ20201603-1	60	<i>Staphylococcus albus</i>	1	1.33×10 <sup>5</sup>	1.03×10 <sup>5</sup>	22.56	1.34×10 <sup>5</sup>	7	99.99				
			2	1.28×10 <sup>5</sup>	1.01×10 <sup>5</sup>	21.09	1.25×10 <sup>5</sup>	7	99.99				
			3	1.36×10 <sup>5</sup>	1.10×10 <sup>5</sup>	19.12	1.39×10 <sup>5</sup>	7	99.99				
			Mean						99.99				
			1	1.11×10 <sup>5</sup>	8.93×10 <sup>4</sup>	19.55	1.26×10 <sup>5</sup>	7	99.99				
			2	1.21×10 <sup>5</sup>	9.79×10 <sup>4</sup>	19.09	1.18×10 <sup>5</sup>	7	99.99				
			<i>Staphylococcus aureus</i>	3	1.15×10 <sup>5</sup>	9.15×10 <sup>4</sup>	20.43	1.05×10 <sup>5</sup>	7	99.99			
				Mean						99.99			
						<i>Escherichia coli</i>	1	1.44×10 <sup>5</sup>	9.52×10 <sup>4</sup>	33.89	1.37×10 <sup>5</sup>	7	99.99
							2	1.39×10 <sup>5</sup>	9.35×10 <sup>4</sup>	32.73	1.28×10 <sup>5</sup>	7	99.99
							3	1.47×10 <sup>5</sup>	1.02×10 <sup>5</sup>	30.61	1.41×10 <sup>5</sup>	7	99.99
							Mean						99.99

Note: The negative control group was sterile growth.

\*\*\*To be continued\*\*\*



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Test results

Number of Sample	Test Time (min)	Test Bacteria	Test Number	Control Group			Test Group		Eliminating Bacterial Rate $K_t$ (%)
				Original Bacteria Count $V_0$ (cfu/m <sup>3</sup> )	Bacteria Count after Treatment $V_t$ (cfu/m <sup>3</sup> )	Natural Decay Rate $N_t$ (%)	Original Bacteria Count $V_1$ (cfu/m <sup>3</sup> )	Bacteria Count after Treatment $V_2$ (cfu/m <sup>3</sup> )	
KJ20201603-1	60	<i>Klebsiella pneumoniae</i>	1	$1.27 \times 10^5$	$9.45 \times 10^4$	25.59	$1.12 \times 10^5$	7	99.99
			2	$1.22 \times 10^5$	$9.31 \times 10^4$	23.69	$1.23 \times 10^5$	7	99.99
			3	$1.20 \times 10^5$	$8.99 \times 10^4$	25.08	$1.04 \times 10^5$	7	99.99
			Mean						
		<i>Serratia marcescens</i>	1	$1.17 \times 10^5$	$8.37 \times 10^4$	28.46	$1.24 \times 10^5$	7	99.99
			2	$1.13 \times 10^5$	$7.75 \times 10^4$	31.42	$1.10 \times 10^5$	7	99.99
			3	$1.21 \times 10^5$	$8.54 \times 10^4$	29.42	$1.33 \times 10^5$	7	99.99
			Mean						
		<i>P.Aeruginosa</i>	1	$1.38 \times 10^5$	$1.07 \times 10^5$	22.46	$1.30 \times 10^5$	7	99.99
			2	$1.33 \times 10^5$	$1.04 \times 10^5$	21.80	$1.42 \times 10^5$	7	99.99
			3	$1.40 \times 10^5$	$1.13 \times 10^5$	19.29	$1.39 \times 10^5$	7	99.99
			Mean						
<i>Candida albicans</i>	1	$1.05 \times 10^5$	$7.37 \times 10^4$	29.81	$1.13 \times 10^5$	7	99.99		
	2	$9.07 \times 10^4$	$6.61 \times 10^4$	27.12	$1.06 \times 10^5$	7	99.99		
	3	$1.08 \times 10^5$	$7.51 \times 10^4$	30.46	$1.19 \times 10^5$	7	99.99		
	Mean							99.99	

Note: The negative control group was sterile growth.

\*\*\*To be continued\*\*\*



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Date Received: Apr. 08, 2020

Date Analyzed: Apr. 09, 2020

**Air Disinfection Test Method:**

1. Test Equipment
  - 1) Strain: *Aspergillus niger*
  - 2) Microbial aerosol generator: TK-3
  - 3) Culture media: PDA
  - 4) Sampling equipment: six-stage sieve sampler
2. Test Conditions
  - 1) The volume of the test chamber: 30 m<sup>3</sup>
  - 2) Environment temperature: (20~25) °C
  - 3) Environment humidity: (50~70) %RH
3. Operational Conditions of the Machine  
Set the switch to position "The highest wind speed", "negative ions".
4. Test Procedure
  - 1) To the 4th to 5th generation of *Aspergillus niger* roxell culture, add 5.0 ml to 10.0 ml of 0.05% (v / v) Tween 80 aqueous PBS solution, scrap the *Aspergillus niger* conidia in solution and transfer the spore suspension with glass beads in the flask, lightly shaking 1 min and filter removed hypha. Centrifuge 20min in the range of 5000r / min ~ 6000r / min . Then observe under the microscope (400 times) , if there are still hypha in the suspension, to be centrifuged. Diluted with physiological saline solution to the appropriate concentration before use.
  - 2) The equipments are placed in the test chambers respectively, close the door, and open the HEPA filter. Simultaneously operate the environmental control devices until the experimental cabin temperature to be (20~25) °C, relative humidity to be (50~70) %, Turn off the chamber environmental control system.
  - 3) Release microbial aerosol: turn on the microbial aerosol generator, then turn on the ceiling fan, turn off the fan after 5 min, and let stand for 5 min.
  - 4) Original Bacteria aerosols collected by six-stage sieve sampler.
  - 5) The air purifier is adjusted to the highest air cleaning mode setting for test (test group), Bacteria aerosols (control group and test group) are collected at 60 min respectively.
  - 6) Choose 2 PDA plates (the same batch) as the negative control, and culture them on the same condition with the samples.
  - 7) Run the test three times and take the mean as the final result.
5. Computational Formula

$$\text{Natural decay rate } N_t(\%) = \frac{V_0 - V_t}{V_0} \times 100$$

Where:  $V_0$  = original bacteria count of control group;  $V_t$  = bacteria count after treatment of control group.

$$\text{Eliminating Bacterial Rate } K_t(\%) = \frac{V_1 \times (1 - N_t) - V_2}{V_1 \times (1 - N_t)} \times 100$$

Where:  $V_1$  = original bacteria count of test group;  $V_2$  = bacteria count after treatment of test group.

\*\*\*To be continued\*\*\*



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Date Received: Apr. 08, 2020

Date Analyzed: Apr. 09, 2020

Test Results

Number of Sample	Test Time (min)	Test Strain	Test Number	Control Group			Test Group		Eliminating Bacterial Rate $K_t$ (%)
				Original Bacteria Count $V_0$ (cfu/m <sup>3</sup> )	Bacteria Count after Treatment $V_t$ (cfu/m <sup>3</sup> )	Natural Decay Rate $N_t$ (%)	Original Bacteria Count $V_1$ (cfu/m <sup>3</sup> )	Bacteria Count after Treatment $V_2$ (cfu/m <sup>3</sup> )	
KJ20201603-1	60	<i>Aspergillus niger</i>	1	$7.59 \times 10^4$	$5.27 \times 10^4$	30.57	$7.92 \times 10^4$	7	99.99
			2	$7.76 \times 10^4$	$5.61 \times 10^4$	27.71	$8.35 \times 10^4$	7	99.99
			3	$7.83 \times 10^4$	$5.79 \times 10^4$	26.05	$8.13 \times 10^4$	7	99.99
			Mean						99.99

Note: The negative control group was sterile growth.

\*\*\*To be continued\*\*\*



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TEST REPORT

Date Received: Apr. 08, 2020

Date Analyzed: Apr. 09, 2020

**Removal of Escherichia coli Phage Performance Test Evaluation Method:**

1. Test Equipment

- 1) Strain: *Escherichia coli* Phage
- 2) Microbial aerosol generator: TK-3
- 3) Culture media: NA

2. Test Conditions

- 1) The volume of the test chamber: 30 m<sup>3</sup>
- 2) Environment temperature: (20~25) °C
- 3) Environment humidity: (50~70) %RH

3. Operational Conditions of the Machine

Set the switch to position "The highest wind speed", "negative ions".

4. Test Procedure

- 1) Thawed the phage solution before test, diluted with sterile deionized water until liquid surface tension was 65 to 69×10<sup>-3</sup> N / m.
- 2) The equipments are placed in the test chambers respectively, close the door and open the HEPA filter. Simultaneously operate the environmental control devices, After reaching requirements and turn off the chamber environmental control system.
- 3) Open the aerosol generator, while stirring side of the bacteria, spray dyeing bacteria after the end of the fan to continue stirring 2 min, and then set aside for 2 min.
- 4) Open the sampling pump to collect the initial suspended phage from the air in the test chamber. Immediately after sampling, the prototype is to be tested and the timepiece is started.
- 5) After 60 min of action, turn off the sample to be tested while opening the sampling pump and collecting the suspended phage from the air in the test compartment.
- 6) Run the test three times and take the mean as the final result.
- 7) Choose 2 NA plates (the same batch) as the negative control, and culture them on the same condition with the samples.

5. Computational Formula

$$\text{Natural decay rate } N_t(\%) = \frac{V_0 - V_t}{V_0} \times 100$$

Where:  $V_0$  = original bacteria count of control group;  $V_t$  = bacteria count after treatment of control group.

$$\text{Killing Rate } K_t(\%) = \frac{V_1 \times (1 - N_t) - V_2}{V_1 \times (1 - N_t)} \times 100$$

Where:  $V_1$  = original bacteria count of test group;  $V_2$  = bacteria count after treatment of test group.

\*\*\*To be continued\*\*\*



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202019001121

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GUANG ZHOU INSTITUTE OF MICROBIOLOGY

TEST REPORT

Date Received: Apr. 08, 2020  
Date Analyzed: Apr. 09, 2020

Test Results

Number of Sample	Test Time (min)	Test Strain	Test Number	Control Group			Test Group		Virus Removal rate $K_t$ (%)
				Original Virus Count $V_0$ (cfu/m <sup>3</sup> )	Virus Count after Treatment $V_t$ (cfu/m <sup>3</sup> )	Natural Decay Rate $N_t$ (%)	Original Virus Count $V_1$ (cfu/m <sup>3</sup> )	Virus Count after Treatment $V_2$ (cfu/m <sup>3</sup> )	
KJ20201603-1	60	<i>Escherichia coli</i> Phage	1	$8.79 \times 10^4$	$5.83 \times 10^4$	33.67	$7.87 \times 10^4$	7	99.99
			2	$7.23 \times 10^4$	$5.18 \times 10^4$	28.35	$7.55 \times 10^4$	7	99.99
			3	$8.54 \times 10^4$	$5.96 \times 10^4$	30.21	$8.76 \times 10^4$	7	99.99
			Mean						99.99

Note: The negative control group was sterile growth.

\*\*\*End of report\*\*\*

Editor

薛萍

Checker

张

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Date Reported







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*Contact Address, NO.1Jiantashan Road, Huangpu District, Guangzhou City, Guangdong Province*

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*Postal Code, 510663*


*Tel., (8620)61302671*

*URL, <http://www.ggtest.com.cn>*

**GUANG ZHOU INSTITUTE OF MICROBIOLOGY**  
**TEST REPORT**

Date Received: Jun. 17, 2020

Date Analyzed: Jun. 21, 2020

Name of Sample	Air purifier	Source of Sample	Delivery
Applicant	Air Doctor LLC	Client	Michael pedersen
Manufacturer		Brand	AirDoctor
Type and Specification	AD3000	Quantity of Sample	1PC
Date of Production	---	State of Sample	Machine
Batch Number	---	Packing of Sample	In box
Sample Picture			
Standard and Methods	1. Referring to GB/T 18801-2015 Air cleaner 2. Referring to <Technical Standard For Disinfection> 2002-2.1.3 Air disinfection effect evaluation test		
Items of Analysis	Removal Rate ( <i>Influenza A virus A/PR8/34 H1N1</i> )		
Remarks	Test voltage: 120V, Test frequency: 60HZ.		

**\*\*\*To be continued\*\*\***

## GUANG ZHOU INSTITUTE OF MICROBIOLOGY

## TEST REPORT

Date Received: Jun. 17, 2020

Date Analyzed: Jun. 21, 2020

## Test Method for Purification Effect of Airborne Virus Aerosols

1. Test Equipment
  - 1) Strain: *Influenza A virus* A/PR8/34 H1N1
  - 2) Cells: MDCK
2. Test Conditions
  - 1) Environment temperature: (23~25) °C
  - 2) Environment relative humidity: (50~60) %
  - 3) Test time: 60 min
  - 4) The volume of the test chamber: 30 m<sup>3</sup>
  - 5) Machine setting: "The highest wind speed", "Negative ions".

## Test Results

Virus	Test Time (min)	Test Number	Virus Titer of Control Group			Virus Titer of Test Group		Removal Rate (%)
			Original Concentration (TCID <sub>50</sub> /m <sup>3</sup> )	Final Concentration (TCID <sub>50</sub> /m <sup>3</sup> )	Natural Decay Rate (%)	Original Concentration (TCID <sub>50</sub> /m <sup>3</sup> )	Final Concentration (TCID <sub>50</sub> /m <sup>3</sup> )	
A/PR8/34 (H1N1)	60	1	3.69×10 <sup>6</sup>	5.85×10 <sup>5</sup>	84.15	2.49×10 <sup>6</sup>	/	≥99.99
		2	1.17×10 <sup>6</sup>	1.73×10 <sup>5</sup>	85.21	3.69×10 <sup>6</sup>	/	≥99.99
		3	1.98×10 <sup>6</sup>	3.69×10 <sup>5</sup>	81.36	5.46×10 <sup>6</sup>	/	≥99.99

Note: "/" means not detected.

\*\*\* End of report\*\*\*

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