


## GUANGZHOU TESTING CENTER OF INDUSTRIAL MICROBIOLOGY

### TEST REPORT

Date Received: August 19, 2017  
Date Analyzed: August 25, 2017

Name of Sample	LITEON UVA + photocatalyst module	Source of Sample	Delivery
Applicant	LITEON TECHNOLOGY CORP.	Client	Peng Yufang
Manufacturer	——	Brand	LITEON
Type and Specification	LTPL-C034UV series	Quantity of Sample	1 PC
Date of Production	20170615	Sample description	Machine
Batch Number	——	Packing of Sample	In box
Sample Picture			
Standard and Methods	<ol style="list-style-type: none"> <li>1. Referring to GB/T 18801-2015 Air cleaner</li> <li>2. Referring to GB 21551.3-2010 Antibacterial and cleaning function for household and similar electrical appliances-Particular requirements of air cleaner</li> </ol>		
Items of Analysis	<ol style="list-style-type: none"> <li>1. Removal Rate (Formaldehyde)</li> <li>2. Killing Rate (<i>Escherichia coli</i> 8099)</li> </ol>		
Remarks	——		

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

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The summary page of test results				
Number of Test	Items of Analysis		Units	Results
KJ20171093	Removal Rate (Formaldehyde)	120 min	%	43.2
		240 min		69.7
	Killing Rate ( <i>Escherichia coli</i> )	60 min	%	94.76
		120 min		99.57

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

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### Method for Testing Gaseous Pollutant Removal:

1. Test Conditions
  - 1) Environment temperature:  $(25 \pm 2)$  °C
  - 2) Environment humidity:  $(50 \pm 10)$  %RH.
2. Test Equipment  
Test chamber (1 m<sup>3</sup>), constant current atmospheric sampler, UV-VIS spectrophotometer.
3. Operation Conditions of the Machine  
Set the switch to position "Voltage of fan: 4 V, Voltage of bulb: 12 V".
4. Test Procedure
  - 1) Place the air cleaner to be tested in the chamber according to the requirements of standard and set the air cleaner controls to the conditions for test. Test for proper operation, then shut off with switch external to test chamber.
  - 2) Using the chamber HEPA filter, allow the test chamber air to clean until the background pollutants reaches a level. Simultaneously operate the environment control devices until the room conditions (temperature and RH) reach a specified state. Turn off the chamber environmental control system (HEPA filter and humidifiers).
  - 3) A certain amount of gaseous pollutant is added into the chamber using the gaseous pollutant generator. After the initial concentration reaches the requirements of standards, close the generator.
  - 4) Mix the gaseous pollutant for 10 min, then turn off ceiling mixing fan.
  - 5) Wait for fan to stop, the initial concentration of sample is gathered.
  - 6) Turn on air cleaner. Collect samples at 120-min intervals for 240 min.
  - 7) According to the step 1) ~ 6), turn off air cleaner, test the natural decay.
5. Computational Formula

$$\text{Natural decay rate } N_t'(\%) = \frac{C_0' - C_t'}{C_0'} \times 100$$

where:  $C_0'$  = the original concentration of control group;  $C_t'$  = the final concentration of control group

$$\text{Total decay rate } N_t(\%) = \frac{C_0 - C_t}{C_0} \times 100$$

where:  $C_0$  = the original concentration of test group;  $C_t$  = the final concentration of test group

$$\text{Removal rate } K_t(\%) = \frac{C_0 \times (1 - N_t') - C_t}{C_0 \times (1 - N_t')} \times 100$$

### Test Results

Number of Sample	Pollutant	Test Time (min)	Control Group		Test Group		Removal Rate $K_t$ (%)
			Concentration $C$ (mg/m <sup>3</sup> )	Natural Decay Rate $N_t'$ (%)	Concentration $C$ (mg/m <sup>3</sup> )	Total Decay Rate $N_t$ (%)	
		0	1.02	—	1.07	—	—
KJ20171093-1	Formaldehyde	120	0.94	7.8	0.56	47.7	43.2
		240	0.88	13.7	0.28	73.8	69.7

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

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### Method for Testing Air Disinfection:

1. Test Equipment
  - 1) Test microorganism: *Escherichia coli*
  - 2) Microbial aerosol generator
  - 3) Culture media: NA
  - 4) Sampling equipment: six-stage sieve sampler
2. Test Conditions
  - 1) The volume of the test chamber: 1 m<sup>3</sup>
  - 2) Environment temperature: (20~25) °C
  - 3) Environment humidity: (50~70) % RH
3. Operation Conditions of the Machine  
Set the switch to position "Voltage of fan: 4 V, Voltage of bulb: 12 V".
4. Test Procedure
  - 1) Get a Bacteria slant culture (4~7 generation) which is incubated at 37 °C for 24 h, wash the culture from this slant with 10 mL NB, filter the liquid culture by aseptic cotton buds, and dilute this inoculums with NB as appropriate.
  - 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 %RH, Turn off the chamber environmental control system.
  - 3) Release microbial aerosol: turn on the microbial aerosol generator, release the microbial aerosol 15~20 min at 0.2 MPa, operate the ceiling mixing fan, then 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 cleaner are adjusted to the highest air cleaning mode setting for test (Test group), Bacteria aerosols (control group and test group) are collected at 60, 120 min respectively.
  - 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.

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

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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**Test Results**

Number of Sample	Test Bacteria	Test Time (min)	Test Number	Control group			Test group		Killing 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> )	
KJ20171093-1	<i>Escherichia coli</i>	60	1	$1.13 \times 10^5$	$7.62 \times 10^4$	32.57	$1.18 \times 10^5$	$4.24 \times 10^3$	94.67
			2	$1.07 \times 10^5$	$7.08 \times 10^4$	33.83	$1.25 \times 10^5$	$3.96 \times 10^3$	95.21
			3	$1.17 \times 10^5$	$8.10 \times 10^4$	30.77	$1.22 \times 10^5$	$4.73 \times 10^3$	94.40
			mean						
		120	1	$1.13 \times 10^5$	$4.08 \times 10^4$	63.89	$1.18 \times 10^5$	$1.77 \times 10^2$	99.58
			2	$1.07 \times 10^5$	$3.35 \times 10^4$	68.69	$1.25 \times 10^5$	$1.59 \times 10^2$	99.59
			3	$1.17 \times 10^5$	$4.37 \times 10^4$	62.65	$1.22 \times 10^5$	$2.12 \times 10^2$	99.53
			mean						

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

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