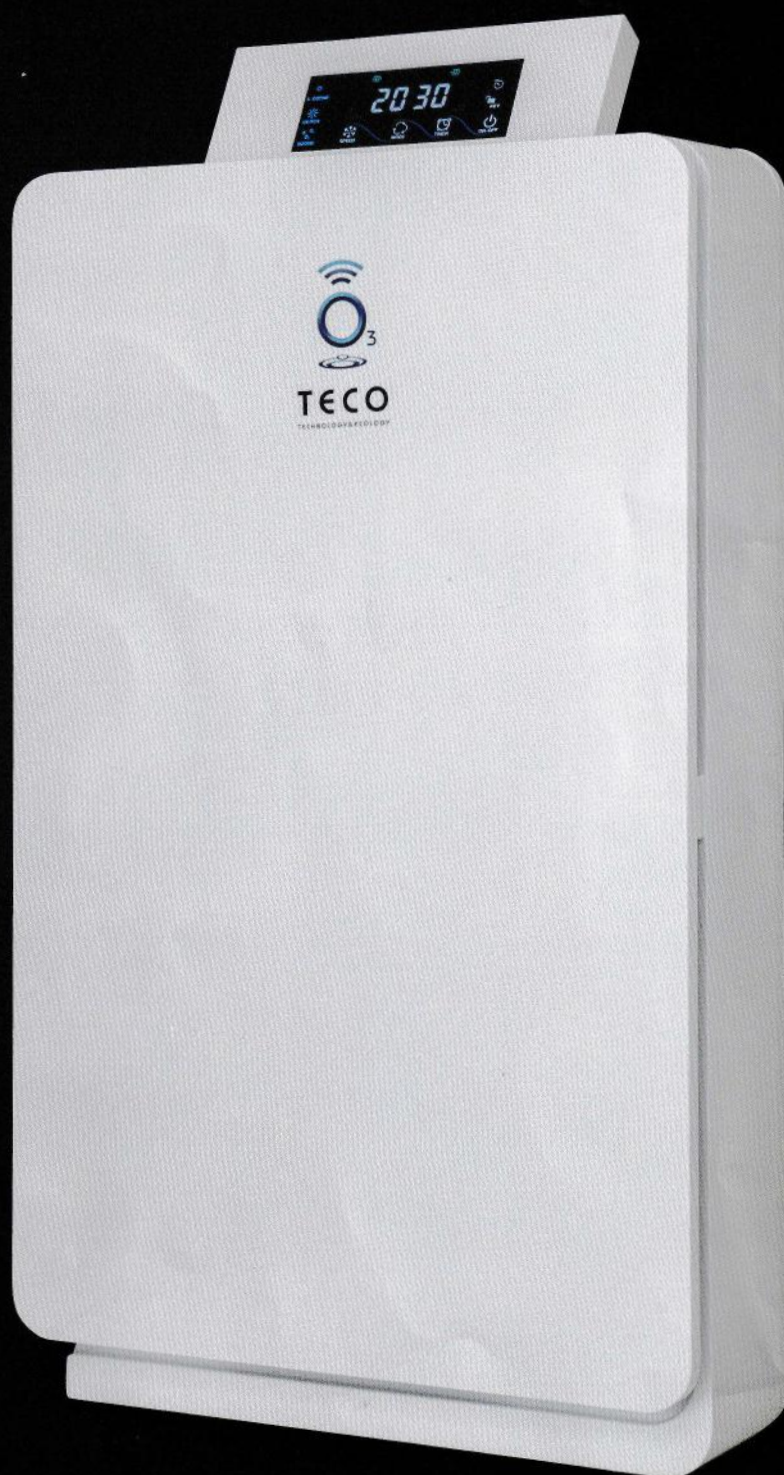


AIR CLEANER WITH OZONE GENERATOR FUNCTION

BT-180H

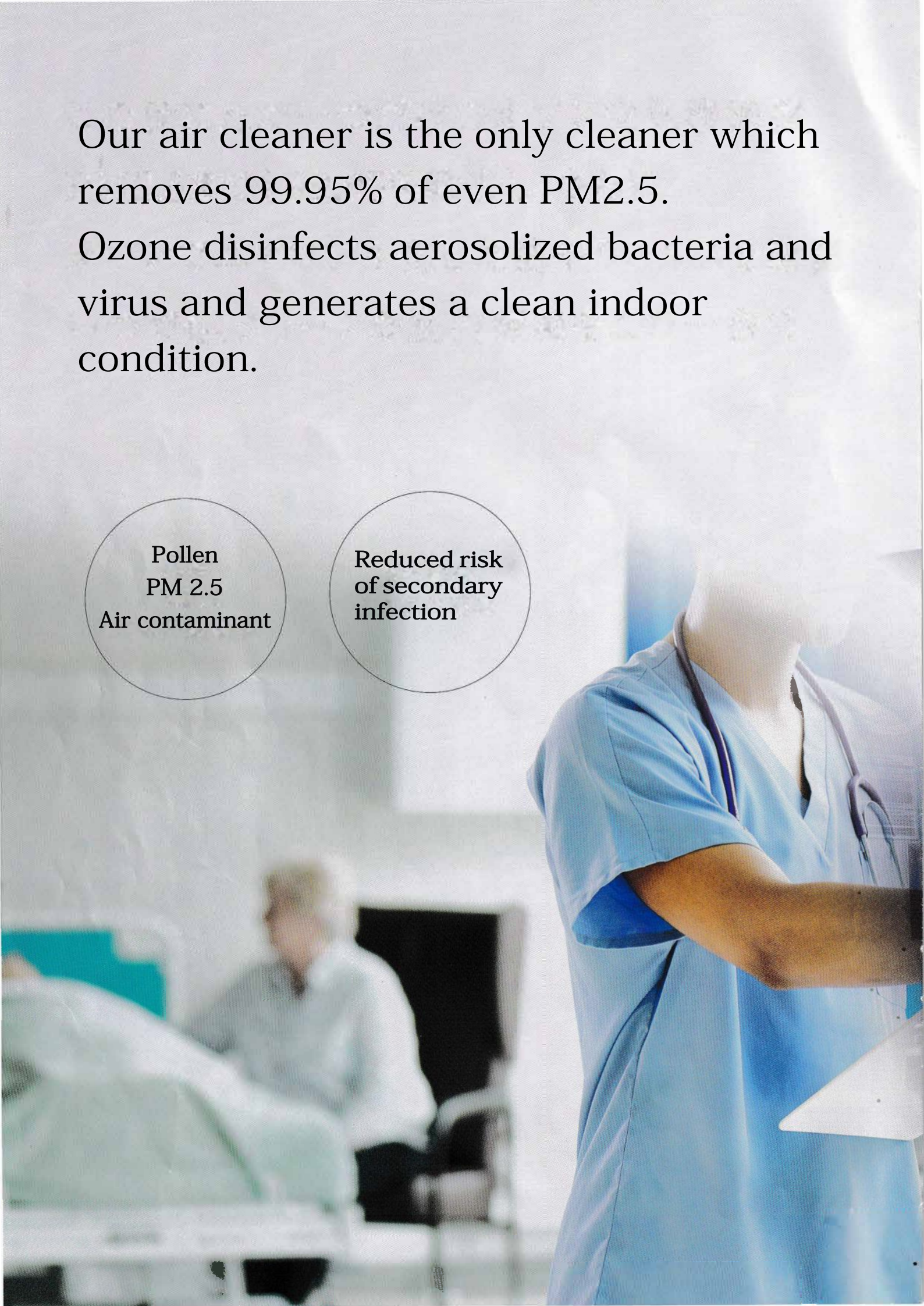


Our air cleaner is the only cleaner which removes 99.95% of even PM2.5.

Ozone disinfects aerosolized bacteria and virus and generates a clean indoor condition.

Pollen
PM 2.5
Air contaminant

Reduced risk
of secondary
infection



Photocatalyst

Titanium oxide is coated on an aluminum honeycomb filter. The OH radical is formed by the reaction with a UV lamp to cause oxidative decomposition of harmful substances in the air.

HEPA filter

H14 EN1822-1 standard. Collecting efficiency for $0.3 \mu\text{m}$ particles: 99.95%

Activated carbon filter

Filled with a large amount of activated carbon particles which absorb causal substances of bad odor or harmful substances in the air.



Air pollution is not just an outdoor problem.
We have to think about indoor (e.g. doctor's office / hospital room) air pollution as well.

*Indoor air pollution is invisible.

Airborne bacteria,
Attached bacteria,
Aerosolized virus,
etc.

Attached bacteria and virus

Aerosol and Surface Stability of SARS-Cov-2 as Compared with SARS-Cov-1

(研究・出典元) THE NEW ENGLAND JOURNAL OF MEDICINE

Viability of target virus in aerosols and various surfaces

In aerosols: 3 hours
Copper surface: 4 hours
Cardboard surface: 24 hours
Plastic surface: 2 to 3 days
Stainless steel surface: 2 to 3 days

Published on "The New England Journal of Medicine" by research team of CDC (the Centers for Disease Control and Prevention), University of California (Los Angeles branch), and Princeton University. *Liquid containing target virus was sprayed to be aerosolized.

Ozone air sterilizes airborne or attached virus in the room and also decomposes substances which cause bad odor.

Two types of ozone concentration can be used depending on the situation.

Low concentration ozone air

Constantly generating weak ozone air which can be operated even if the environment is occupied with people.

High concentration ozone air

Occupied

Selectable from 1-hour operation or 2-hour operation
Repeating operation for 20 seconds following pause for 40 seconds

Unoccupied

At any time since the time you left (setting time)
[Timer function]
High ozone air fumigation

Ozone sterilizes even **attached virus**. This is verified by the following tests of our products.

Test of influenza virus inactivation by ozone gas

Test laboratory: Kitazato Research Center for Environmental Science

[Date] August 6, 2009

[Place] Virus department of Kitazato Research Center for Environmental Science

[Tested virus] Influenza A virus

[Specimen] Ozone gas (concentration of 0.1 ppm) [Ozone gas generator BT-03 (TT-11DK)]

[Operation time] duration of ozone exposure: 0, 1, 2, 3 hour(s) / controls (non-exposure): 0 (initial virus infection value (common with samples exposed to ozone)), 3 hour(s)

[Method of test]

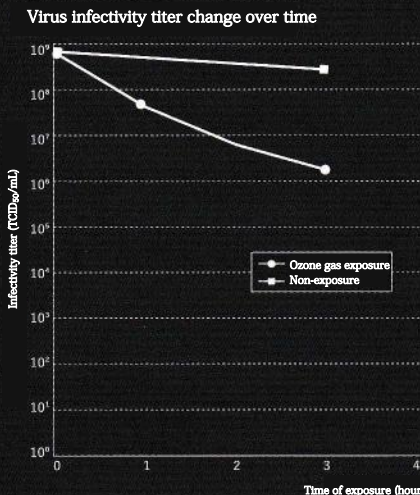
1. Virus liquid of 0.1 mL was applied on petri plate.
2. The petri plate was dried for 20 minutes inside a safety cabinet.
3. The ozone generator and four(*2) petri plates were arranged inside a chamber (*1).
4. The plates with virus were exposed to generated ozone gas.
5. The plates were brought out for several times to collect virus.
6. The infectivity titer of collected virus liquid was measured.

[Temperature / humidity inside chamber] Temperature: 23°C (at beginning)

27°C (at end) Humidity: 65% (at beginning) 55% (at end)

*1 made of vinyl chloride of W1,000×D400×H390 / volume: about 156L

*2 one of the four plates was as a backup.



[Table 1]

Virus infectivity titer change due to ozone exposure over time

Type of sample	Duration of action (hour)			
	0 (initial)	1	2	3
Ozone gas exposure	6.3 × 10 ⁸	4.5 × 10 ⁷	6.3 × 10 ⁶	1.7 × 10 ⁶
Non-exposure	6.3 × 10 ⁸	***	***	2.9 × 10 ⁸

Unit: TCID₅₀/mL (tissue culture infectious dose 50:50 tissue infectivity titer)

[Table 2]

Log reduction value of virus infectivity titer due to ozone exposure

Type of sample	Duration of action (hour)			
	0 (initial)	1	2	3
Ozone gas exposure	0.0	1.1	2.0	2.6
Non-exposure	0.0	***	***	0.3

Reduced infectivity titer (LRV) - log₁₀ (initial titer / titer after each period of time)

Test of ozone sterilization against Mycobacterium tuberculosis H37RV and BCGTokyo strain



結核研究所

Test laboratory: Research Institute of Tuberculosis Japan Anti-Tuberculosis Association

Test 1: Sprayed time of ozone against Mycobacterium tuberculosis H37RV and resulting sterilization effect

Type of test	Sprayed time of ozone	Incubation result	
1	5sec.	++++	++++
2	10sec.	++++	++++
3	30sec.	++++	++++
4	1min.	+++	+++
5	3min.	++	++
6	5min.	++	++
7	10min.	++	++

Test 2: sterilization effect against spraying inhaled BCGTokyo strain

Type of test	Sprayed amount and time of BCGTokyo	Detected bacteria number on 7H10 agar plate medium	
		Ozone + UV	Positive control
1	4.2 × 10 ² cfu/min.	0	41
2	2.1 × 10 ² cfu/30sec.	0	22
3	4.2 × 10 ¹ cfu/min.	0	2
4	2.1 × 10 ¹ cfu/30sec.	0	0
5	4.2 × 10 ⁰ cfu/min.	0	0
6	2.1 × 10 ⁰ cfu/30sec.	0	0

In case ozone was sprayed more than 3 min., a relative sterilization effect, i.e. "effect of reducing bacteria" with respect to extension of duration was recognized.

The sterilization effect of Mycobacterium tuberculosis H37RV was recognized when concentration of ozone was 0.3 ppm, 0.3 ppm × 3 min., and CT value of 0.9 or more.

Following test with ozone + UV, bacteria was not detected in spraying inhaled BCGTokyo strains at any tests.

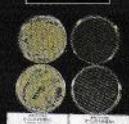
When compared with positive controls, the device indicates complete sterilization effect against sprayed virus.

BIOZONE BT-088M sterilization ability evaluation test result

Blue pus

MRSA

MSSA



Blue pus

MRSA

MSSA

Reduced by 99% or more

*Note that the data is from BT-088M (approved medical apparatus (class II)) and not the test data of BT-180H.



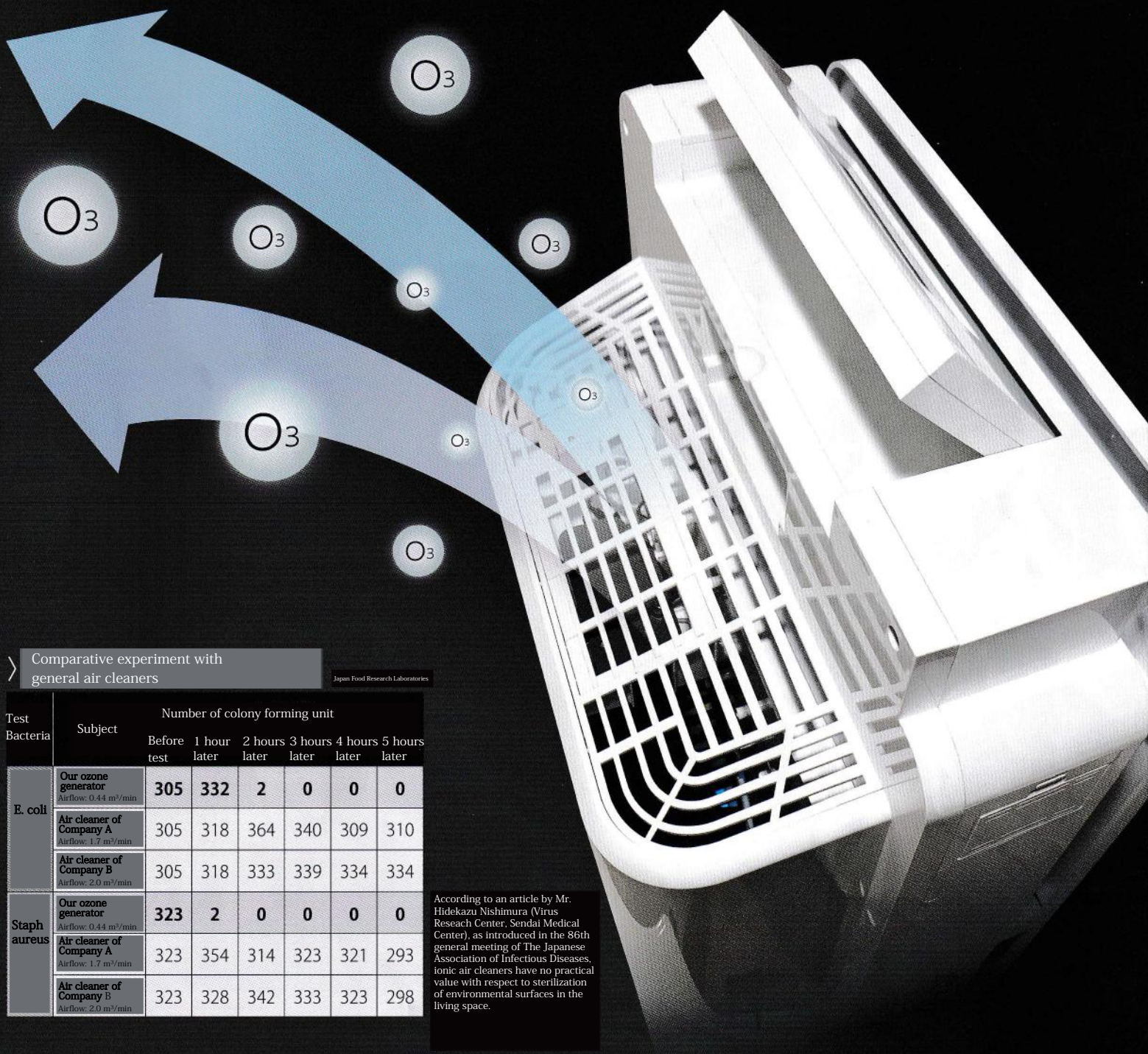
New

Coil Ozone Generator

Our novel coil ozone generator adjusts amount of generated ozone. The maximum amount is 600 mg/h (when the space is unoccupied). When occupied, it generates low concentration ozone of about 0.1 ppm which is safe if people are around to mildly sterilize and get rid of smell in the indoor environment.

High concentration ozone generator

Low concentration ozone generator



Comparative experiment with general air cleaners

Japan Food Research Laboratories

Test Bacteria	Subject	Number of colony forming unit					
		Before test	1 hour later	2 hours later	3 hours later	4 hours later	5 hours later
E. coli	Our ozone generator Airflow: 0.44 m ³ /min	305	332	2	0	0	0
	Air cleaner of Company A Airflow: 1.7 m ³ /min	305	318	364	340	309	310
	Air cleaner of Company B Airflow: 2.0 m ³ /min	305	318	333	339	334	334
Staph aureus	Our ozone generator Airflow: 0.44 m ³ /min	323	2	0	0	0	0
	Air cleaner of Company A Airflow: 1.7 m ³ /min	323	354	314	323	321	293
	Air cleaner of Company B Airflow: 2.0 m ³ /min	323	328	342	333	323	298

According to an article by Mr. Hidekazu Nishimura (Virus Research Center, Sendai Medical Center), as introduced in the 86th general meeting of The Japanese Association of Infectious Diseases, ionic air cleaners have no practical value with respect to sterilization of environmental surfaces in the living space.

Operation when occupied

Auto operation

Highly accurate indoor environment sensor (for dust and odor) monitors room condition and selects an optimal operation mode.



Indoor environment indicator



Manual operation

It is also possible to manually set wind strength.



Wind strength indication

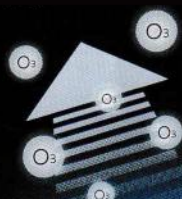
Low concentration ozone air



Sterilization by high concentration ozone air



Intermittent operation (operation for 20 seconds and pause for 40 seconds)



Sterilization and odor elimination by photocatalyst



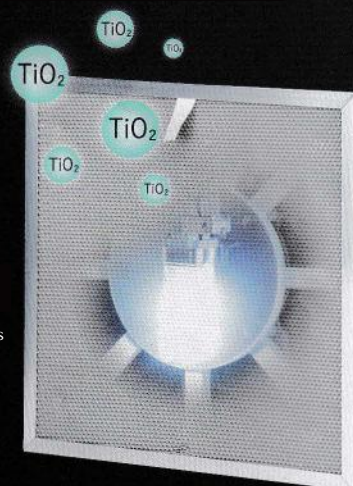
Two kinds of active oxygen, O_2^- (superoxide ion) and $\cdot OH$ (hydroxyl radical) are generated on titanium oxide surface.

Decomposition of pollution substances in the air



Effect of sterilization, sanitization and mold proof

Decomposition of bad smell substances such as ammonia



Sleep mode with quiet operation also available



Operation when unoccupied

Ozone fumigation mode by setting start time



While unoccupied, your room is sterilized by highly concentrated ozone air.



Setting start time of ozone fumigation



Setting duration of fumigation

All adjustable by remote controller



[Specifications]

Item code	BT-180H			
Voltage	AC100V 50/60Hz			
Output in decontamination	600mg/h			
Output in decontamination	15mg/h			
UV lamp	8w			
Air flow	turbo	strong	medium	weak
Power consumption	99w	90w	85w	78w
Timer	1H / 2H / 4H / 8H			
Applicable area	Up to 100m ²			
Length of electric cord	1.80m			
Dimension	W400 × D240 × H680m			
Weight	10.5kg			



【Manufacturer】



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