

# Air Purifier

Healthy Air Because of

# DAIKIN 'Pure' Air



Scan to watch our exclusive Air Purifier video











#### Model debut in a compact and stylish design!

#### MCK55UVMM Humidification **Dust collection** Deodorisation Capacity in turbo operation mode Humidifying capacity\*2 Air purification Humidification + air purification Air purification only $500_{mL/h}$ Airflow 5.5 m³/min. Airflow 5.5 m<sup>3</sup>/min. Applicable room area ~ 41m<sup>2</sup> Applicable room area Prefab: ~23m2 Wooden: ~14m2 Approximate room cleaning time 13.2m<sup>2</sup>/11min. MC55XVMM MC40XVMM Dust collection Deodorisation Dust collection Deodorisation Capacity in turbo operation mode Capacity in turbo operation mode Air purification Air purification Air purification only Air purification only Airflow 5. 5 m<sup>3</sup>/min. Airflow 4.0 m<sup>3</sup>/min. Applicable room area Applicable room area ~ 31m<sup>2</sup>\* ~ 41m<sup>2\*1</sup> Approximate room cleaning time Approximate room cleaning time 13.2m<sup>2</sup>/11min. 13.2m<sup>2</sup>/15min.

#### Note:

- \*I Calculated by test method based on Japan Electrical Manufacturers' Association Standard JEM1467. Operation during turbo mode has been approximated.
- \*2 Humidifying capacity by JEM1426 (electric humidifier) with turbo operation at temperature of 20°C and humidity of 30%.



Ideal for bedrooms and other small rooms. The sophisticated appearance fits in perfectly with a room's interior design.



# INDEX

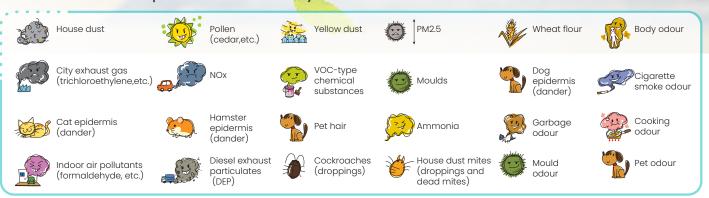
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# **Double Method**





#### Pollutants that can be captured and deodorised by filters:



#### Pollutants that can be reduced:



# Daikin's Unique Double Method

OUTSIDE

000

\* MCK55 and MC55 models only.

#### **Active Plasma Ion Flow Out**

The plasma ion technology uses plasma discharge to release ions into the air, which combine with components of the air to form active species with strong oxidizing power like OH radical. They attach to the surface of fungi and allergens and decompose proteins in the air by oxidation.

Mechanism of reduction by active plasma ions

Concentration: 25,000 ions/cm<sup>3\*1</sup>



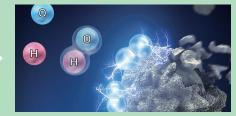


Image is for illustrative purposes

\*1 The number of ions per 1cm³ of air blown into the atmosphere measured near the air outlet during operation with maximum airflow. Test conditions: temperature 25°C, humidity 50%.

Daikin's plasma ions have been proven to be safe in regards to effects on skin, eyes and respiratory organs. Testing organization: Life Science Laboratories, Ltd.

Name of test: repeated-dose toxicity test

Test number: 12-II A2-0401

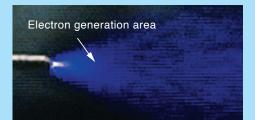
Note:



#### **INSIDE**

#### **Decomposition By Streamer**

Streamer, a type of plasma discharge, decomposes hazardous chemical substances. The decomposition power is comparable to thermal energy of about 100,000°C.\*2



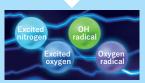
#### Note:

\*2 Comparison of oxidation decomposition.
This does not mean temperature
will become high.

#### Mechanism of decomposition by Streamer



Streamer emits high-speed electrons.



The electrons collide and combine with nitrogen and oxygen in the air to form four kinds of decomposing elements with decomposition power.



The decomposing elements provide decomposition power.

# Three Steps To Decompose Harmful Substances



# Effective Capture Of Pollutants Catches dust and pollutants effectively with an electrostatic HEPA filter.



#### Note:

\*1 (Reduction of gases) Testing organization: Life Science Research Laboratory.

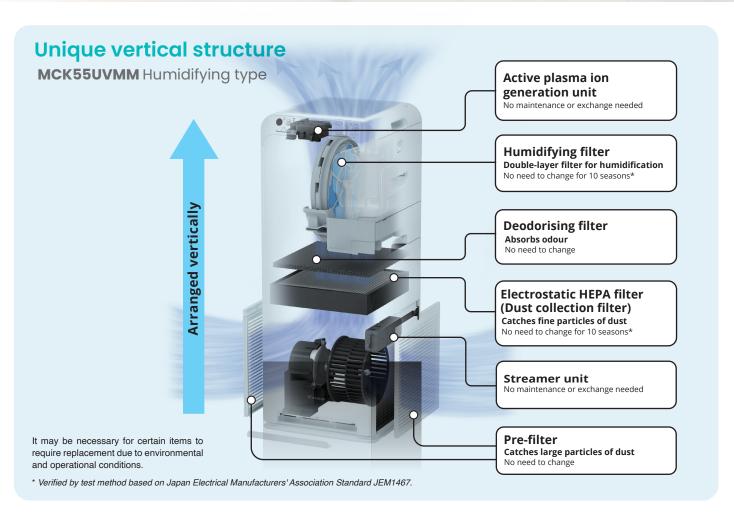
Test method: After operating a gasoline engine for 10 minutes (when particulate concentration reached 60mg/m³), operated the air purifier for 80 minutes to absorb polluting dust emitted from the engine.

Operated this air purifier for 24 hours in a closed space of 200L and measured the effect to decompose gases.

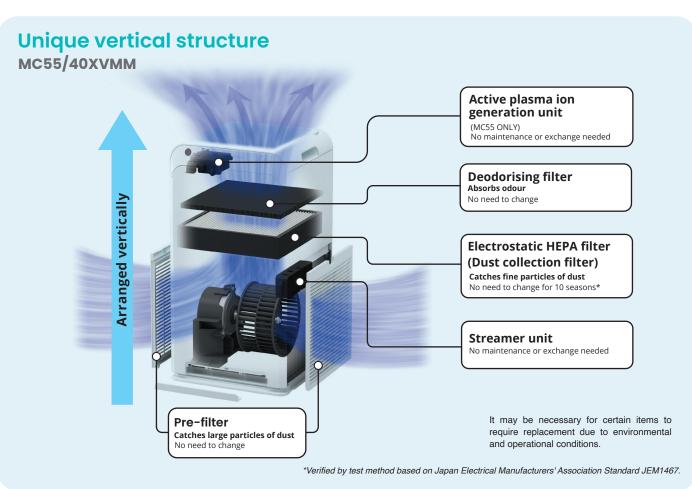
Test result: Compared with a test without Streamer irradiation, gas components were reduced by 63% in 9 hours.

Test number: LSRL-83023-702.

Test unit: Tested with MCK70N (Japanese model).

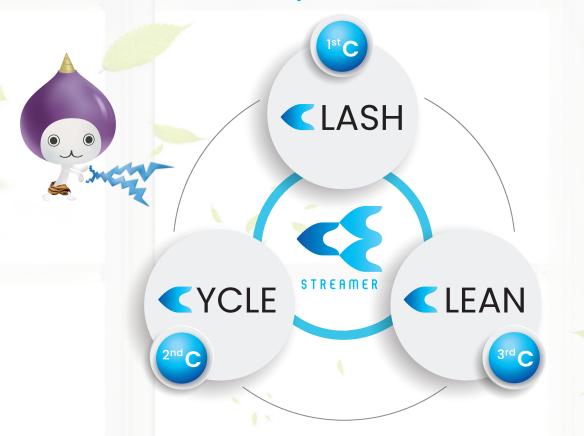






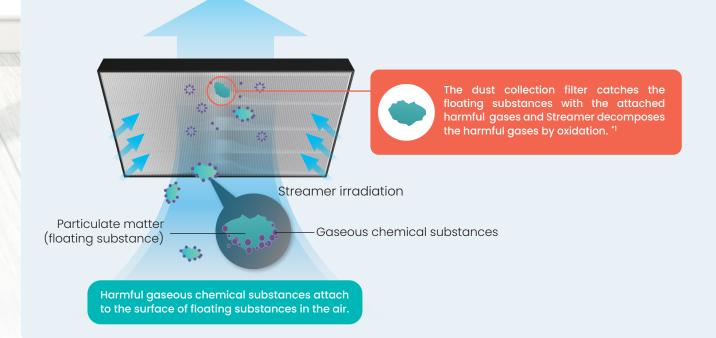
# The 3C's of Streamer

#### The Streamer symbol consists of three C's





Decomposes harmful substances on the dust collection filter by oxidation!



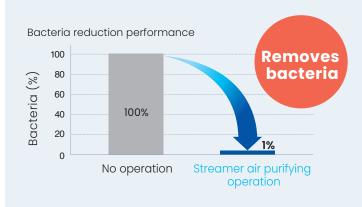




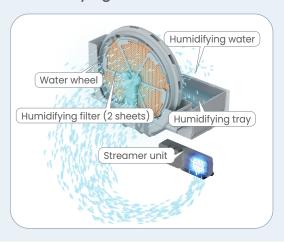
## **CLEAN**

Removes bacteria from dust collection filter\*3, humidifying filter\*4, and humidifying water.\*5

• Dust Collection Filter



• Humidifying Filter (MCK55 model only)



#### Note:

- \*(Reduction of gases) Testing organization: Life Science Research Laboratory. Test method: After operating a gasoline engine for 10 minutes (when particulate concentration reached 60mg/m³), operated the air purifier for 80 minutes to absorb polluting dust emitted from the engine. Operated this air purifier for 24 hours in a closed space of 200L and measured the effect to decompose gases. Test result: Compared with a test without Streamer irradiation, gas components were reduced by 63% in 9 hours. Test number: LSRL-83023-702. Test unit: Tested with MCK70N (Japanese model).
- \*2 Placed the air purifier and an odour component, acetaldehyde, in a box of 21 m³ and operated the air purifier. Examined increase of concentration of product (CO2) generated by decomposition of acetaldehyde by Streamer (evaluation by Daikin).

  Test unit: Tested with MCK55S (Japanese model), a model equivalent to MCK55T series.
- \*3 Testing organization: Japan Food Research Laboratories. Test number: 15044988001-0201. Test method: Attached a test piece inoculated with bacteria liquid on the upstream side of a dust collection filter installed in an air purifier, and operated it in a test area of 25 m³. Counted the number of live bacteria after five hours. Test object: A type of bacterium. Object part: Dust collection filter. Test result: Reduced by more than 99% in five hours. Test unit: Tested with MCK55S (Japanese model), a model equivalent to MCK55T series (turbo operation).
- \*4 (Removal of bacteria from humidifying filter) Works on objects caught by the humidifying filter. Testing organization: Japan Food Research Laboratories. Test number: 15044989001-0101

  Test method: Attached a test piece inoculated with bacteria liquid on the unstream side of a humidifying filter installed in an air purifier and operated.
  - Test method: Attached a test piece inoculated with bacteria liquid on the upstream side of a humidifying filter installed in an air purifier, and operated it in a test area of 25 m³. Counted the number of live bacteria after five hours. Object part: Humidifying filter. Test result: Reduced by more than 99% in five hours. Test unit: Tested with MCK55S (Japanese model), a model equivalent to MCK55T series (turbo operation).
- \*5 (Reduction of bacteria in humidifying tray) Testing organization: Japan Food Research Laboratories. Test number: 15044985004-0101.

  Test method: Performance evaluation test by voluntary standard of Japan Electrical Manufacturers' Association (HD-133). Test object: Moulds and bacteria in humidifying water. Test result: Reduced by more than 99% in 24 hours. Test unit: Tested with MCK55S (Japanese model), a model equivalent to MCK55T series (turbo operation).

This product can be used to improve the quality of the air by removing airborne hazardous chemical substances, allergens, mould, bacteria, and viruses, etc. However, this product is not intended for the creation of sterile environments or for the prevention pathogen infections.

This description relates to the Streamer Technology devised by Daikin, but not to this Air Purifier. Test results from use of the Streamer Technology are generated according to prescribed test methods conducted by Daikin. Although the Streamer Technology is contained within this Air Purifier, this does not mean that precisely the same results will be experienced using this Air Purifier. Actual results may differ depending on the conditions of product installation and use of the actual product, etc.



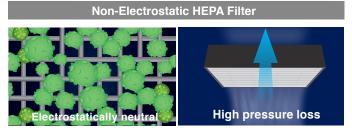
#### Comparison Between Electrostatic HEPA Filter And Non-Electrostatic HEPA Filter

The filter collects dust efficiently with electrostatic forces. It is not prone to clogging compared with unelectrified HEPA filters which collect particles only by the fineness of the mesh.

Therefore, a larger amount of air can pass through the filter. The filter can purify a larger amount of air!

# Electrostatic HEPA Filter Low pressure loss

Filter fiber itself is charged with static electricity, and collects particles efficiently. Doesn't clog easily because of low pressure loss.



Because it catches particles relying only on mesh size, it is necessary to make mesh finer, making it easy to be clogged.

About the dust collection and deodorising capacity of air purifiers:

- Not all harmful substances in cigarette smoke (carbon monoxide, etc.) can be removed.
- Not all odour components that emanate continuously (building material odours and pet odours, etc.) can be removed.

This product is not a medical device, medical treatment device or a therapeutic good.

This product is not intended to have any therapeutic use or to be used for the diagnosis, treatment, relief or prevention of illness. If you have a health concern or are not feeling well, please consult a health care professional.

# Powerful Humidification to Protect against Air Dryness and Viruses

#### **Benefit of Humidification**

Protects the skin, the throat and the nostril from dryness.



Protects against viruses by maintaining appropriate humidity of the room.



#### Select the target humidity from 3 levels

(The target humidity is a rough estimation.)



50%

#### Indicates humidity of the room

**HUM** monitor (%) 40 50

#### Eliminates bacteria on the humidifying filter \*1

Effect after five hours in a test space of about 25 m<sup>3</sup>.

This is an effect in a test space and not a test result in an actual operation space.



The humidifying tray needs regular maintenance (once in about a week). This is not a verification result in an actual operation environment.

The humidifying tray is irradiated with Streamer as well as the humidifying filter to reduce bacteria in the water.

By keeping the water and its surroundings clean, the air purifier provides clean air and humidity to the room.

Use tap water to fill the tank, and replace with fresh water every day. Using well water or water from water purifiers makes bacteria develop faster.

#### Features for clean humidification

- The humidifying tray is equipped with a silver ion agent
- being directly soaked in water

## \*2 (Reduction of bacteria in humidifying tray) Testing organization: Japan Food Research Laboratories.

Test method: Performance evaluation test by voluntary standard of Japan Electrical Manufacturers' Association (HD-133).

Test object: Moulds and bacteria in humidifying water.

Test number: 15044985004-0101.

Water wheel

**Humidifying filter** 

(2 sheets)

Test result: Reduced by more than 99% in 24 hours.
Test result: Reduced by more than 99% in 24 hours.
Test unit: Tested with MCK55S (Japanese model), a model equivalent to MCK55T series (turbo



- A water wheel system to keep the humidifying filter from



\*1 (Removal of bacteria from humidifying filter) Works on objects caught by the humidifying filter. Testing organization: Japan Food Research Laboratories.

Test number: 15044989001-0101.

Test method: Attached a test piece inoculated with bacteria liquid on the upstream side of a humidifying filter installed in an air purifier, and operated it in a test space of 25 m³. Counted the number of live bacteria after five hours.

Object part: Humidifying filter.

Test result: Reduced by more than 99% in five hours.

Test unit: Tested with MCK55S (Japanese model), a model equivalent to MCK55T series (turbo operation).

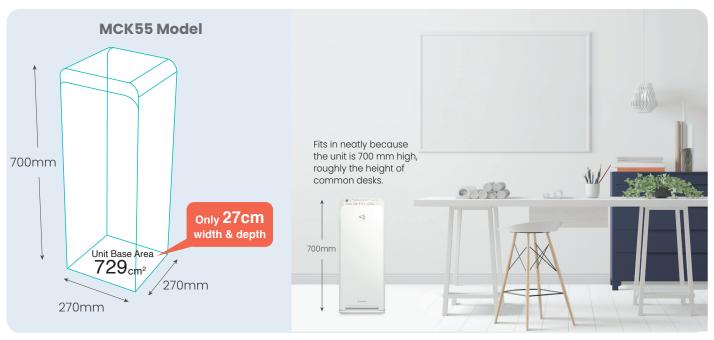






# New Stylish and Compact Design

#### Flexible choice of where to place the unit



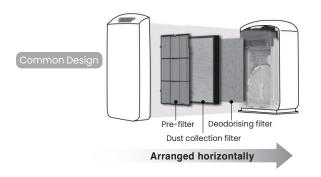




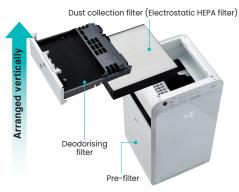


# Powerful Suction and Reduced Operation Sound

#### Compact, effective and quiet thanks to the new, innovative structure



MC55 / 40 Models



#### **Powerful suction in 3 directions**

Effectively takes in dust over a wide area



Air above the air inlet is attracted into the faster airflow from the air outlet.



#### MCK55 Model

Takes in large amounts of air because the air inlet is located apart from the air outlet and the airflow from the outlet is soft.



#### Operation sound sensed by people is reduced

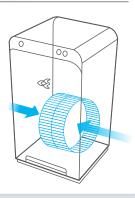
# The key is the sound of airflow from the air outlet

Daikin succeeded in reducing the operation sound sensed by people by adopting a wide air outlet and positioning the fan below the filters for soundproofing effect.



#### The fan is positioned below

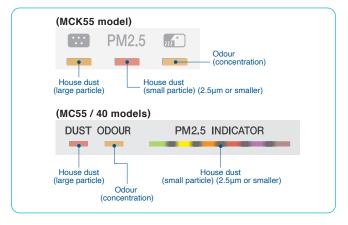
Positioned farthest from people's ears. The filters also provide a soundproofing effect, so the operation sound is not disturbing.



#### Convenience

# "Triple detection" sensor to quickly detect PM2.5

Equipped with a high sensitivity dust sensor that distinguishes small particles such as PM2.5 and larger particles of dust and reacts accordingly. Along with the odour sensor, "triple detection" of dust, PM2.5 and odour is provided.



#### **An Air Purifier To Remove Pm2.5**

Removes 99% of particles between 0.1µm and 2.5µm \*1

# Entry of new particles from outdoors, for example by ventilation, is not considered.

"PM2.5" refers to general fine particulate matters sized 2.5 µm or smaller. This air purifier has not been proved to remove very fine particles of less than 0.1µm.

This product does not remove all harmful substances in the air. The test results are effects in a closed space of  $32m^3$  and not in an actual operation space.

Test unit: Tested with MCK55S (Japanese model), a model equivalent to MCK55T series.

#### Note

<sup>\*1</sup> Test method: Japan Electrical Manufacturers' Association Standard JEM1467. Criterion: Remove 99% of fine particulate matters of 0.1 to 2.5μm in a closed space of 32m3 within 90 minutes. (Converted to a value in a test space of 32m³)

#### Choose from the various operation modes

- Auto Fan mode
- Econo mode for energy saving
- Anti-Pollen mode
- Moist mode (MCK55 model only)
   Humidity is automatically adjusted to be gentle on the skin and throat.

# (MCK55 model) MODE ■②[A] ■ □ □ □ □ □ (MC55 / 40 models) MODE ■ AUTO ■ ECONO ■ POLLEN

#### Other useful features

• Filter cleaning without needing to open the panel

Just vacuum with a vacuum cleaner. No need to open the panel to clean the filter.



• Easy-to-detach water tank (MCK55 model only)

The water tank is conveniently placed in a high position for easy detaching. The compact size of the tank makes it easy to replenish water in a sink or a wash basin.



 Equipped with a remote controller (MCK55 & MC55 models only)

Convenient for operation from a distant position.





MCK55 model

MC55 model

• Equipped with roll-away casters (MCK55 model only)

Easy to move to clean the floor.



# Best Solutions for Indoor Air Quality

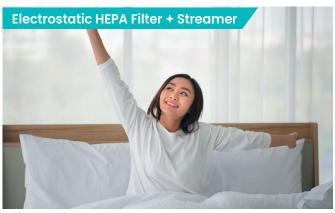
PROBLEMS -----























#### Humidifying type



Dimensions: 270mm(W)x270mm(D)x700mm(H)

#### Specifications

Colour			White							
Mode			Air purifying operation			Humidifying operation				
Applicable	Air purification		41							
room area*1	Air purification + Humidification	m²	41			Prefab : 23 Wooden : 14				
Power supply			1 Phase, 220-240/220-230V, 50/60Hz							
Mode			Quiet	Low	Standard	Turbo	Quiet	Low	Standard	Turbo
Airflow rate		m³/m	0.9	2.0	3.2	5.5	1.7	2.4	3.2	5.5
Power consun	Power consumption		7	10	17	56	11	14	19	58
Sound pressure level		dB	19	29	39	53	25	33	39	53
Humidification*2 m		mL/h					200	240	300	500
Dimensions mm			H700 X W270 X D270							
Weight kg			9.5 (Without water)							
Dust collection method			Electrostatic HEPA filter							
Humidifying method			Evaporation type Element							
Tank capacity			About 2.7L							
Optional accessories			Replacement dust collection filter : KAFP080B4E (Purchase of new filters is needed after about 10 years)*3							
			Replacement humidifying filter : KNME080A4E							
			Caster: KKS080B41							

- Calculation based on testing method of the Japan Electrical Manufacturers' Association standard. (JEM1467)
- \*2 Humidification amount changes in accordance with indoor and outdoor temperature and humidity.

Measurement condition: 20°C in temperature, 30% in humidity. (JEM1426)

"3 Verified by test method based on Japan Electrical Manufacturers' Association Standard JEM1467.
The standard assumes five or more cigarettes are smoked per day.

Not all harmful substances in cigarette smoke (carbon monoxide, etc.) can be removed. More frequent filter changing may be needed depending on operating conditions.

About the dust collection and deodorising capacity of air purifiers:

- Not all harmful substances in cigarette smoke (carbon monoxide, etc.) can be removed.
  Not all odour components that emanate continuously (building material odours and pet odours, etc.) can be removed.

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#### **Main Function:**







Humidification















Streamer

Active Plasma lons

3-directional inlets

Deodorising filter



#### **Specifications**

Colour			White					
Mode			Air purifying operation					
Applicable room area*1	Air purification	n m²		41 (13.2m² purified in approx. 11 min.)				
Power supply			1 Phase, 220 -240/220 -230V, 50/60Hz					
Plug shape			C type					
Mode			Quiet	Low	Standard	Turbo		
Airflow rate m³/min.			1.1	2.0	3.2	5.5		
Power consumption W			8	10	15	37		
Sound pressure level dB			19	29	39	53		
Dimensions mm			H500 X W270 X D270					
Weight kg			6.8					
Dust collection filter			Electrostatic HEPA filter					
Optional accessories	Replacement filter	Dust collection	KAFP080B4E (1 sheet) (Purchase of new filters is needed after about 10 years)*2					

- Calculation based on testing method of the Japan Electrical Manufacturers' Association standard. (JEM1467)
- \*2 Verified by test method based on Japan Electrical Manufacturers' Association Standard JEM1467.

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#### **Main Function:**























#### **Specifications**

Colour			White				
Mode			Air purifying operation				
Applicable room area *1	Air purification	n m²		31 (13.2m² purified in approx. 15 min.)			
Power supply			1 Phase, 220 - 240/220-230V, 50/60Hz				
Plug shape			C type				
Mode			Quiet	Low	Standard	Turbo	
Airflow rate m³/min.			1.1	1.8	2.8	4.0	
Power consumption W			7	9	13	23	
Sound pressure level dB			19	27	36	49	
Dimensions mm			H500 X W270 X D270				
Weight kg			6.8				
Dust collection filter			Electrostatic HEPA filter				
Optional accessories	Replacement filter	Dust collection	KAFP080B4E (1 sheet) (Purchase of new filters is needed after about 10 years)*2				

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#### **Main Function:**

















# **Functions**



## **Functions**

#### • Temperature And Humidity Sensors

Humidity is detected and shown by an easy-to-understand indicator.

#### Dust (Pm2.5/dust) And Odour Sensor Lamp

"Triple detection" is performed by a dust sensor (which distinguishes small particles, such as PM2.5 and larger particles of dust, and reacts accordingly) and an odour sensor.

#### Streamer Discharge

This function quickly decomposes odours and allergens, etc., with high speed electrons that have a powerful ability to oxidize.

#### Active Plasma Ion

The active plasma ion technology decomposes odours and allergens in the air by plasma ions with strong oxidizing power.

#### Electrostatic HEPA Filter

There is a high-performance filter that catches 99.97% of 0.3µm fine particles and requires no changing for 10 years.

#### Deodorising Filter

Odours and adjuvants are caught on the catalyst and decomposed by the power of Streamer.

#### Moist Mode

Automatic control maintains relatively high humidity that is gentle to the throat and the skin.

#### Econo Mode

Operation automatically switches only between "Quiet" and "Low" modes in accordance with the degree of polluted air.

#### Auto Fan Mode

The air purifier is run, without wasteful operation, only in accordance with the level of pollutants in the air, which is detected by the sensor.

#### Anti-Pollen Mode

Switching between "standard" and "low" modes to create a gentle turbulence, pollen is caught before it lands on the floor.

#### Turbo Mode

This convenient mode provides high-power operation to quickly clean the air in a room when, for example, you come home or when you have guests over.

#### Child Proof Lock

This can be used to prevent small children from mishandling the air purifier.

#### Brightness Adjustment

The brightness of the indicator panel lamp can be adjusted.

#### Auto-restart After Power Failure

The air purifier memorises the settings for mode, airflow, etc., and automatically returns to them when power is restored after a power failure.

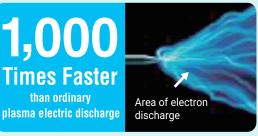
#### Stabilizer Free

Stabilizer free operation protects the vital components of machine from power fluctuations. With this function installing stabilizer becomes needless (voltage range protection: 180~264V). If power fluctuation is beyond the limit mentioned then a stabilizer is required.

# Daikin's Streamer Technology

"Streamer Discharge" is a type of plasma discharge which generates high speed electrons that combine with oxygen and nitrogen in the air and turn into active species with strong oxidative decomposition power and thereby eliminate allergens such as mould, mites (droppings and dead mites), and pollen, and hazardous chemical substances such as formaldehyde. Compared to standard plasma discharge (glow discharge), its speed of oxidative decomposition is over 1000 times greater with the same electrical power.

The decomposition power is comparable to thermal energy of about 100,000°C.\*1



Note:

These are effects in a Streamer test space and not verification results in an actual operation space.

# Streamer decomposes and eliminates allergens such as pollen, mould, and mites (droppings and dead mites) \*2 \*3





Proved with 13 pollen based allergens including cedar pollen and cypress pollen





Proved with 6 fungal allergens including Alternaria and Eurotium

Pollen, mould, and mites (dead mites) were placed on the electrode of the Streamer Discharge unit and then photographed through an electron microscope after being irradiated with Streamer Discharge for 15 minutes.

<Joint research with Wakayama Medical University>

Decompose And Eliminate Pollen

99.6%<sup>2</sup> in 2 hours!

Decompose And Eliminate Mould

99.9%'3
in 24 hours!

Decompose And Eliminate Allergens Such As Mite Droppings And Dead Mites

Eliminated more than 99.61%<sup>2</sup> in 24 hours!

#### Note:

Test conditions: Irradiated allergens with Streamer and checked decomposition of allergen proteins by either the ELISA method, electrophoresis or electron microscopy.

Test result: 99.6% eliminated. (Works on objects caught by the filter)

\*3 Measuring method: antibacterial test/mould elimination test Testing organization: Japan Food Research Laboratories.

Test number: 204041635-001. Test result: 99.9% eliminated.

This product can be used to improve the quality of the air by removing airborne hazardous chemical substances, allergens, mould, bacteria, and viruses, etc. However, this product is not intended for the creation of sterile environments or for the prevention pathogen infections. This description relates to the Streamer Technology devised by Daikin, but not to this Air Purifier. Test results from use of the Streamer Technology are generated according to prescribed test methods conducted by Daikin. Although the Streamer Technology is contained within this Air Purifier, this does not mean that precisely the same results will be experienced using this Air Purifier. Actual results may differ depending on the conditions of product installation and use of the actual product, etc.

<sup>\*1</sup> Comparison of oxidation decomposition.

This does not mean temperature will become high.

<sup>&</sup>lt;sup>2</sup>Testing organization: Wakayama Medical University.

# A clean technology that's recognised by public institutions\* in Japan and abroad.

★ Following experiments were practised by third parties based on Daikin industries, Ltd's request.

Target of experiment		★ Public institutions (Testing organization)	Test method	
		National Institute of Hygiene and Epidemiology (Vietnam)	CPE and TCID50	
	Virus	Kitasato Research Center of Environmental Sciences	CPE and TCID50	
		Kobe University Graduate School	ELISA method	
		Yamagata University	Scanning electron microscope	
Bacteria Mould		Japan Food Research Laboratories	PCR method	
		The Jikei University	CFU	
		Japan Food Research Laboratories	Pour plate culture method	
	Pollen based allergens			
A.II	Allergens from animate beings	Wakayama Medical University	ELISA method	
Allergens	Fungal allergens	wakayana wedicai Oniversity	LLIOA IIIetilou	
	Flour			
	Adjuvant (DEP)	Yamagata University	ELISA method	
Hazardous	Adjuvant (VOC)	Tohoku Bunka Gakuen University	Damping technique	
chemical substances	Adjuvant inhibiting effect	Wakayama Medical University, National institute for Environmental Studies	ELISA method	
	Formaldehyde	Tohoku Bunka Gakuen University	Constant generation method	

#### Viruses and bacteria that have been proven to be deactivated by Streamer Technology

- Influenza virus (type A, H1N1) Highly virulent avian influenza virus (type A, H5N1) Bacillus coli, O-157
- Staphylococcus aureus Tuberculosis bacteria Norovirus Pseudomonas aeruginosa Toxins (enterotoxins)

#### Allergens that have been proven to be decomposed by Streamer Technology

- Fungal allergens: sooty moulds, aspergillus, eurotium, aspergillus niger, fusarium, penicillium
- Pollen based allergens: cedar pollen, alder pollen, birch pollen, Japanese cypress pollen, pencil cedar pollen, bald cypress pollen, mugwort pollen, orchard grass pollen, ragwood pollen, sweet vernal grass pollen, timothy grass pollen, fleawort pollen, Japanese beech
- Allergens from animate beings: house dust mite [dermatophagoides pteronyssinus] (droppings and dead mites), house dustmite [dermatophagoides farinae] (droppings and dead mites), American cockroach (droppings), German cockroach (droppings), flea (droppings), dog epidermis (dander), cat epidermis (dander), hamster epidermis (dander)
- Other: wheat flour

#### Hazardous chemical substances that have been proven to be removed by Streamer Technology

- Formaldehyde\*4 Diesel exhaust particulates (DEP)
- Hazardous chemical substances in exhaust gas: NOx, tetrachlorethylene, benzene, trichloroethylene, dichloroethane, dichloromethane, chloroform
- VOC type hazardous chemical substances: iso-butanol, hexane, styrene, nonanoic acid, trimethyl benzene, xylene, naphthalene, ethyl benzene, toluene, ethyl acetate

#### Note:

\*4 Test method: constant generation method

Test room: 22 to 24 m<sup>3</sup>

Temperature: 23 ±3°C

Humidity: 50 ±20%

Ventilation condition: When concentration of 0.2 ppm is continually emanated, a removal capacity of 0.08 ppm is maintained at 36 m³/h, which is within the guideline of the Ministry of Health, Labour and Welfare (Japan). (This equates to the ventilation capacity of an approximately 65 m³ room.)

About the dust collection and deodorising capacity of air purifiers:

- Not all harmful substances in cigarette smoke (carbon monoxide, etc.) can be removed.
- Not all odour components that emanate continuously (building material odours and pet odours, etc.) can be removed.

This product is not a medical device, medical treatment device or a therapeutic good.

This product is not intended to have any therapeutic use or to be used for the diagnosis, treatment, relief or prevention of illness. If you have a health concern or are not feeling well, please consult a health care professional.

# Experimental Results of Daikin Streamer Technology

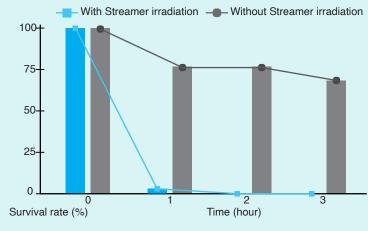
Demonstration of the inactivating effects against the novel Coronavirus (SARS-CoV-2) by Streamer technology 99.9% inactivation after 3 hours

#### **Experimental result**

Daikin in collaboration with a group of research professors from the Department of Microbiology in the Faculty of Veterinary Medicine from the Okayama University of Science, led by Professor Shigeru Morikawa, has demonstrated that the Streamer technology has inactivating effects against the novel Coronavirus (SARS-CoV-2).

This result was obtained by using a Streamer discharge device for testing in lab conditions.

The effect of products equipped with Streamer technology or results in actual use environments may differ.



Source: "Study report on the inactivation effect of plasma ion generator (Daikin Streamer) on SARS-CoV-2" written by Shigeru Morikawa, Department of Veterinary Medicine, Microbiology Course, Okayama University of Science.

As a result of the test, SARS-CoV-2 was inactivated by 93.7% after 1 hour of Streamer irradiation. After 2 hours, it was inactivated by more than 99.8%, reaching more than 99.9% after 3 hours of Streamer irradiation.

Streamer irradiation time	1 hour	2 hours	3 hours
Novel Coronavirus (SARS-CoV-2) inactivation rate	93.6%	99.7%	99.9%

\* This result was obtained by using a Streamer discharge device for testing in lab conditions. The effect of products equipped with Streamer technology or results in actual use environments may differ.

#### **Testing organization**

Professor Shigeru Morikawa's led research group at the Department of Microbiology in the Faculty of Veterinary Medicine from the Okayama University of Science

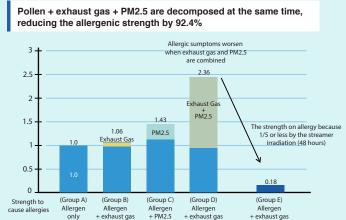
#### **Test method**

Two acrylic boxes of about 31L were mounted inside a safety cabinet. One box was equipped with a Streamer discharge device and the other box was not. A see-saw rocking motion shaker was placed in each box, and a six-well plate was placed on top of the motion shaker. Virus solution measuring 0.5 ml was put into each well of the plates, and Streamer irradiation was performed while agitating the solution using the motion shaker (approximately 12 times per minute). Virus solution was collected from two wells every hour for three hours, and viral load was measured. The viral load of SARS-CoV-2 was quantified by the TCID50 method using Vero E6 / TMPRSS2 cells.

\* (This result was obtained by discharge device for testing in lab conditions. The effect of products equipped with Streamer technology or results in actual use environments may differ.)

## Simultaneous decomposition of pollen + exhaust gas + PM2.5 which worsens hay fever.

It was found that the streamer technology decomposes cedar pollen, and at the same time, it also decomposes exhaust gas (diesel exhaust particles) and PM2.5 that worsen hay fever, dramatically reducing the intensity of allergic reactions.



+ exhaust gas

+ PM2.5

+ exhaust gas

+ PM2.5 after the streamer irradiation As a result of the test, the allergenic strength was 2.36 times higher in the D group, in which exhaust gas and PM2.5 were added to the allergen, than in the A group containing only the allergen. It is speculated that the simultaneous administration of a mixture of exhaust gas and PM2.5 enhanced the immune reaction that causes allergic symptoms such as hay fever. On the other hand, the allergenic strength of group E, which was exposed to the Streamer for 48 hours, was reduced by 92.4% compared to group D.

\* This is the demonstration result using a streamer discharge device for testing.

The effect of products equipped with Streamer technology or the effect in actual use environment may differ.

#### **Testing organization**

+ exhaust gas

Demonstrated at Yamagata University under the supervision of Professor Shirasawa, Tohoku Bunka Gakuen University

#### **Test method**

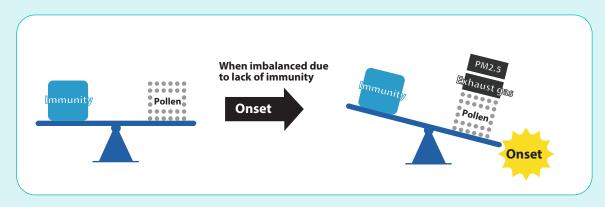
A comparative experiment was performed on 3 groups of mice. (Group A) allergen, (B group) allergen + exhaust gas, (C group) allergen + PM2.5, (D group) allergen + exhaust gas + PM2.5, (Group E) allergen + exhaust gas + PM2.5 after the Streamer irradiation, was administered respectively. Administration to mice was continued every 2 weeks, and 8 weeks later, IgE antibody\*1 concentration in the blood of the mice was measured. We used ovalbumin as the allergen, which is a typical substance used in immunity experiments as an alternative to pollen.

\*1: When a reaction with an allergen occurs in the body, an IgE antibody that can bind only to the allergen is produced, and when the reentered allergen reacts with the IgE antibody, various allergic symptoms are caused. Since it is detected only in a very small amount in healthy people, it is generally used for immunological tests.

#### Hay fever development

Adjuvant substances that worsen allergic symptoms may adhere to pollen, which may upset the balance that was previously maintained and increase the risk of developing hay fever.

• The Image of the hay fever development



(This result was obtained by discharge device for testing in lab conditions. The effect of products equipped with Streamer technology or results in actual use environments may differ.)

# Decomposes molds and mites (feces and carcasses). Suppresses the causes of allergies.

Decomposes molds and mites (feces and carcasses). Suppresses the causes of allergies.

\* This is the demonstration result using a streamer discharge device for testing.

The effect of products equipped with Streamer technology or the effect in actual use environment may differ.

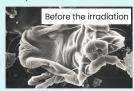
#### Demonstration of the decomposition against molds and mites (carcasses)

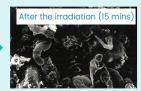
#### The picture of molds





#### The picture of mites (carcasses)





#### **Testing organization**

Joint research with Wakayama Medical University.

#### **Test method**

"Mold" and "mite (carcass)" were placed on the electrodes of the Streamer discharge unit, and after being exposed to the Streamer discharge for 15 minutes, they were photographed with an electron microscope.

\* This is the demonstration result using a streamer discharge device for testing.

The effect of products equipped with Streamer technology or the effect in actual use environment may differ.

#### Demonstration of the suppression against molds



#### **Testing organization**

Japan Food Research Laboratories

#### **Test method**

A test piece in which the bacterial solution was cultured was placed in a container, the test Streamer generator was operated, and the viable cell count was measured after 24 hours.

As a result of the experiment, it was confirmed that 99.9% of molds was suppressed in 24 hours by the Streamer irradiation.

\*This is the demonstration result using a streamer discharge device for testing.

The effect of products equipped with Streamer technology or the effect in actual use environment may differ.

\* (This result was obtained by discharge device for testing in lab conditions. The effect of products equipped with Streamer technology or results in actual use environments may differ.)

## Demonstration of the suppression against allergic effects of mites (feces and carcasses)



#### **Testing organization**

Wakayama Medical University.

#### **Test method**

Allergen analysis was confirmed by ELISA method using a test Streamer generator.

As a result of the experiment, it was confirmed that 99.6% of allergic effects of mites (feces and carcasses) was suppressed in 24 hours by the Streamer irradiation.

\* This is the demonstration result using a streamer discharge device for testing.

The effect of products equipped with Streamer technology or the effect in actual use environment may differ.

#### Relationship between molds, mites and allergies

Since both molds and mites prefer a moist environment, they breed when the humidity is high. Moreover, because the mites in the room are fed by molds, mites are more likely to occur in places where molds breed. When these molds and the feces/carcasses of mites touch human's skin or be inhaled, they cause various allergic symptoms such as atopic dermatitis, asthma, rhinitis and itchy eyes.

<sup>\* (</sup>This result was obtained by discharge device for testing in lab conditions. The effect of products equipped with Streamer technology or results in actual use environments may differ.)

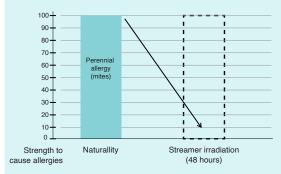
# Decomposes house dust (mite's feces and carcasses) that causes perennial allergic symptoms

It has been confirmed that the Streamer technology decomposes house dust (mite's feces and carcasses) that causes perennial allergies. It was also found that when year-round allergy and seasonal allergy are combined, allergic symptoms may worsen or develop, but these causative substances are also decomposed at the same time.

\*This is the demonstration result using a streamer discharge device for testing.

The effect of products equipped with Streamer technology or the effect in actual use environment may differ.

#### Suppresses the deterioration of allergic symptoms caused by mites (feces and carcasses)



As a result of the test, it was confirmed that allergic symptoms caused by mites (feces and carcasses) were suppressed 99% or more in 48 hours by the Streamer irradiation.

This is the demonstration result using a streamer discharge device for testing. The effect of products equipped with Streamer technology or the effect in actual use environment may differ.

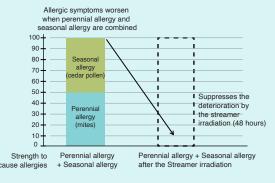
#### **Testing organization**

Demonstrated at Yamagata University under the supervision of Professor Shirasawa, Tohoku Bunka Gakuen University

#### **Test method**

As a typical causative agent of perennial allergy, the Streamer was irradiated to house dust mite (Dermatophagoides pteronyssinus) at different times. The inactivation rate (the rate of loss of allergic ability) is measured by the allergen activity before and after the irradiation by the ELISA method (a method of detecting and quantifying the ability of an allergen to bind to an antibody by using an enzymatic reaction).

#### Suppresses the deterioration of allergic symptoms caused by mites (feces and carcasses) + cedar pollen



As a result of the test, it was confirmed that the 99% or more of the deterioration of allergic symptoms due to mites (feces and carcasses) + cedar pollen was suppressed in 48 hours after the Streamer irradiation.

\* This is the demonstration result using a streamer discharge device for testing. The effect of products equipped with Streamer technology or the effect in actual use environment may differ.

#### **Testing organization**

Demonstrated at Yamagata University under the supervision of Professor Shirasawa, Tohoku Bunka Gakuen University

#### **Test method**

The house dust mite (Dermatophagoides pteronyssinus) as a typical causative agent of perennial allergy, and the cedar pollen antigen as a typical causative agent of seasonal allergy were irradiated with the Streamer at different times. The inactivation rate (the rate of losing the ability to cause allergies) was measured by the allergen activity before and after the irradiation by the ELISA method (a method of detecting and quantifying the power of an allergen to bind to an antibody using an enzymatic reaction).



\* (This result was obtained by discharge device for testing in lab conditions. The effect of products equipped with Streamer technology or results in actual use environments may differ.)

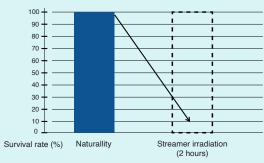
# Decomposes and suppresses Moraxella bacterium, which causes the laundry's damp odour.

It is known that the bacteria causing the laundry's damp odour that occurs when drying clothes in the room are Moraxella bacteria. It was confirmed that the Streamer technology decomposes and suppresses the bacteria that cause this damp odour.

\* This is the demonstration result using a streamer discharge device for testing.

The effect of products equipped with Streamer technology or the effect in actual use environment may differ.

#### Demonstration of the suppression against Moraxella bacterium Bacillus (causative agent of the laundry's damp odour)



As a result of the test, it was confirmed that Moraxella bacterium (causative agent of the laundry's damp odour) was decomposed and suppressed by 99.8% in 2 hours after the Streamer irradiation.

\* This is the demonstration result using a streamer discharge device for testing. The effect of products equipped with Streamer technology or the effect in actual use environment may differ.

#### **Testing organization**

Japan Food Research Laboratories

#### **Test method**

A sample containing 2 ml of the test bacterial solution in a petri dish ( $\phi$ 60 mm) was left to stand in the streamer generator. The suppression effect was obtained from the results of measuring the number of bacteria after 1, 2, 3, 4, and 6 hours. The Streamer discharge device and test bacteria were provided by Daikin. The number of measurements was 3 times.



# To suppress the laundry's damp odour, it is ideal to dry it within 5 hours!

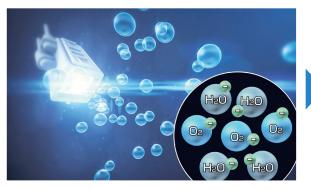
The most important thing to prevent the generation of the damp odour is the "time from the end of washing to the drying". Moraxella bacteria explosively grows after about 5 hours, so if you can dry it within 5 hours, you can suppress the damp odour to some extent. What we would like to keep in mind here is the trick of drying clothes in the room. First, it is important to hang it in a well-ventilated place. It is assumed that many people hang it on the curtain rail, but it is the worst place because it is easy for moisture to accumulate at the window and there are many germs and, we also devised how to dry. You can quickly dry the clothes by hanging the long one on the outermost side of the clothes hanger, the "arch drying" that hangs the short one in the middle, or the "ghost drying" that puts only the sleeve part of the long-sleeved shirt on another hanger... Considering the growth of bacteria, it is recommended to use a dehumidifier or air conditioner equipped with an air cleaning function. If you're worried about odour, please give it a try, as the laundry odour can be suppressed with a little effort like this.

\* (This result was obtained by discharge device for testing in lab conditions. The effect of products equipped with Streamer technology or results in actual use environments may differ.)

# Daikin's Active Plasma Ion Technology

The plasma ion technology uses plasma discharge to release ions into the air, which combine with components of the air to form active species with strong oxidizing power like OH radical. They attach to the surface of fungi and allergens and decompose proteins in the air by oxidation.

#### Assumed mechanism of elimination



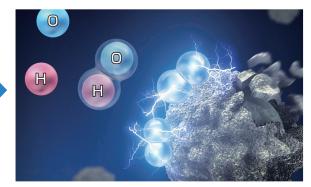


Image is for illustrative purposes

Daikin's plasma ions have been proved to be safe.
Safety concerning effect on skin, eyes, and respiratory organs.
Testing organization: Life Science Laboratories, Ltd.
Name of test: repeated-dose toxicity test
Test number: 12-II A2-0401

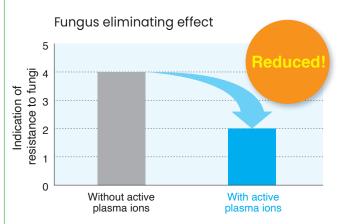
Concentration: 25,000 ions/cm<sup>3</sup>\*1

Note:

\*1 The number of ions per lcm³ of air blown into the atmosphere measured near the air outlet during operation with maximum airflow. Test conditions: temperature 25°C, humidity 50%

These are effects in an active plasma ion test space and not verification results in an actual operation space.

#### Reduction of attached fungi



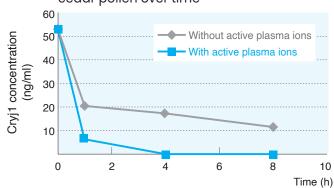
Test name: test of resistance to fungi.

Testing organization: Japan Spinners Inspecting Foundation. Test number: 019190-1.

Test result: After cultivation in a 9L container according to Japanese Industrial Standard JISZ2911, generation of fungi was reduced to less than half.

#### Reduction of allergens

Change in concentration of allergen of cedar pollen over time



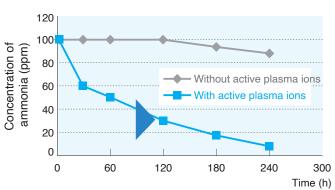
Test name: Test of reduction of allergen of cedar pollen.
Testing organization: ITEA/Institute of Tokyo Environmental Allergy.

Test number: 11MRPTMAY031.

Test result: Allergen of cedar pollen in a 45L container was reduced by more than 95.5% in about 8 hours.

#### **Deodorisation**

#### Deodorisation of ammonia



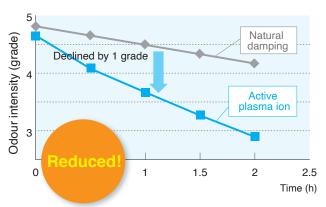
Test name: Deodorisation test.

Testing organization: Japan Spinners' Inspecting Foundation. Test number: 200097-1.

Test result: In a 5L container, ammonia was reduced by 92.3% in about 240 minutes.

#### Removal of attached odour

#### Effect to remove attached odour



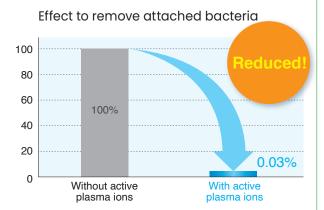
Test method: In a test chamber of a size of about 6 tatami mats, evaluated deodorising effect on a piece of cloth to which tobacco odour components were attached by 6-grade odour intensity indication method.

Test result: Odour intensity declined by 1 grade in about 1 hour (tested by Daikin).\*

A one-grade decline of odour intensity means a 90% reduction of odour.

\* The deodorisation effect varies depending on the ambient environment (temperature and humidity), operation time, odour, and the type of fiber.

#### Reduction of attached bacteria



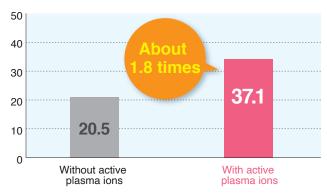
Test name: antibacterial test.

Testing organization: Japan Spinners' Inspecting Foundation. Test number: 028669.

Test result: In a 9L container, reduced by more than 99.97% in 24 hours

#### Increase of skin moisture

## Change in skin moisture (difference in integrated skin moisture of 120 minutes)



Organization: Soiken (Comprehensive Medical Science Laboratory).

Number: MII-2010-10.

Method: Measured skin moisture of 8 healthy women prone to skin dryness in a room of about 6 tatami mats under conditions with and without active plasma ions.

Result: Skin moisture increased by about 1.8 times in about 120 minutes.

\* Actual effect will vary depending on room conditions and method of use.

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