

Plasmacluster, Available in a Diverse Lineup of Devices

Delivering Clean, Fresh Air in a Variety of Daily Life Situations

From ion generators to refrigerators, vacuum cleaners, and of course air conditioners for your living room, the lineup of devices from SHARP that include Plasmacluster is truly abundant. Plasmacluster delivers clean, refreshing air throughout your home!



* Available in only certain models.

SHARP



New Standard for Clean Air
Plasmacluster – Only from SHARP

Leading-edge technology for health and the environment from SHARP.

SHARP

SHARP CORPORATION OSAKA, JAPAN

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New Standard for Clean Air
Plasmacluster – Only from SHARP

Plasmacluster Reader



Let Plasmacluster
Solve Your
Concerns about the Air!

Effective
All Year Round!!

Remarkable Mechanism for Suppressing Mold and Allergens

The Proof of the Effectiveness and Safety of High-Density Plasmacluster Ions



Everywhere
You'll Find Plasmacluster!

SHARP

Let Plasmacluster Solve Your Concerns about the Air!

Effective All Year Round!!



New Standard for Clean Air
Plasmacluster – Only from SHARP



Pollen

Pollen and air pollution, etc., are known causes of hay fever.
A synergistic effect with the air purifier's filter*1 effectively traps pollen*1.



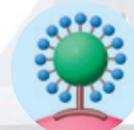
Pollen

Mold

Airborne mold spores adhere to a variety of objects and, at the appropriate temperature and humidity, send out multicellular filaments known as hyphae in order to grow. Some of them are beneficial used in food production, such as aspergillus, but there are some which are even toxic.



Airborne mold



Adhering mold

A Word from the Developer 1

I want to contribute to creating comfortable, healthy living conditions.

Tatsuo Fukuda, Dept. General Manager, PCI System Development Dept., Air Conditioning Systems Division Health and Environment Systems Group, Sharp Corporation



This is the 10th anniversary since Plasmacluster was first installed in an air purifier and placed on the market. We have repeatedly evolved that technology and the corresponding effect, and over the years have proven Plasmacluster's efficiency on 28 kinds of toxic substances at leading science research laboratories both in Japan and abroad, and we have also validated the mechanisms for decomposition and removal as well as product safety. We have earned the solid trust of diverse industries through these results and have received testimonials of appreciation from customers who have actually experienced the effects: "The smell of our pets was removed from the room," "Offensive odors were minimized and that was a major help to our nursing work," etc. It is our hope that everyone will be able to experience the effects and benefits of Plasmacluster.

Get rid of adhering pollen!

Pollen, a problem during the warm seasons

As the weather turns nice and warm, it's the perfect season for outdoor activities like walking and cycling. But a large amount of pollen is also generating at this time, making it a very problematic season for people who are sensitive to pollen.

Static electricity attracts pollen into clothing, etc.

Another problem during warm seasons is static electricity. When the air is dry, static electricity is generated through synthetic fibers rubbing together. Our clothes are enveloped in both plus- and minus-charged electricity and we've all probably experienced playing as a child and creating static electricity by rubbing

our clothes with the pencilboard, etc., and making our hair stand on end. Static electricity has the ability to attract various things. No matter how cautious we are when outside, static electricity attracts pollen and, once it adheres to our clothes or to curtains, it isn't easy to remove. Even if we make a serious effort to brush it off outside, pollen still makes it indoors.

Plasmacluster removes static electricity

With a plasma discharge, a large amount of positive and negative ions is released. By neutralizing static electricity with ions, the adhesion of pollen to curtains and clothing, etc., is suppressed*2. To remove pollen, the filters of air purifiers demonstrate their effectiveness synergistically with Plasmacluster ions.

The season when mold proliferates The season when odor of sweat is a concern

Mold, a concern in seasons of high-humidity

As the temperature and humidity rise, mold begin to become active. The various kinds of mold in our living environments, such as red and blue mold, as well as the black mold often seen on window sashes, etc., are not only unpleasant, some are even toxic.

Decomposing and removing airborne mold

Plasmacluster discharges hydrogen ions (+) and oxygen ions (-) that adhere to the surface of mold and are transformed into OH radicals with very powerful oxidizing capabilities. By cutting into and removing the protein in the cell membrane on the

surface of the mold, these OH radicals decompose and remove airborne mold*3 and suppress the proliferation of adhering mold*4. They also serve to deodorize the smell of cigarettes that can permeate throughout the room*5.

No more worries about that persistent odor of sweat

Sweat comes hand-in-hand with hot weather. And the odor of sweat becomes ingrained into the clothes we wear every day. Beds and bedding also absorb sweat while we sleep and children's rooms can become full of that sweaty smell.

Deodorizing even the ingrained smell of sweat*6

Plasmacluster is gentle on clothes and decisively deodorizes even that ingrained odor of sweat*6.

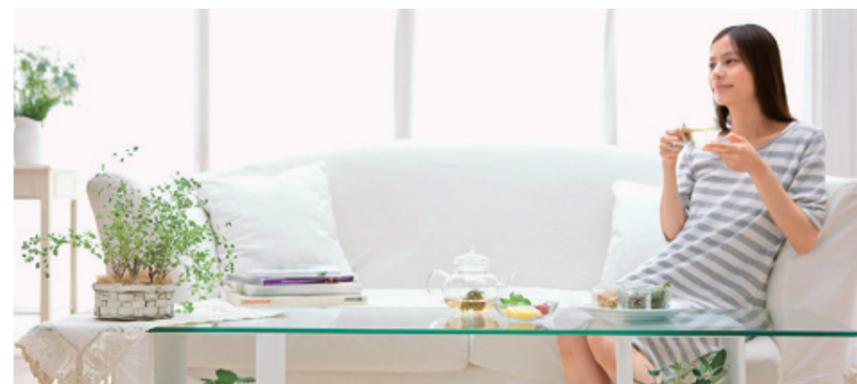
Adhering sweat odor

Sweat is mainly just water, but it also contains uric acid, sebum, and other substances. Initially, sweat is both colorless and odorless, but the microbes already on the surface of the skin and impurities contained in sweat act upon each other and result in the individual odors that sweat demonstrates. That odor adheres to our clothes and becomes further concentrated once it dries. This is what adhering sweat odor is.



Mold is not only active in seasons of high humidity!

Due to the airtight conditions and the spread of heating in today's homes, condensation is easily generated even in dry seasons and that is the very environment that mold enjoys for breeding. Then, once the weather turns humid, the mold that has grown during those dry periods further proliferates and scatters a large volume of spores.



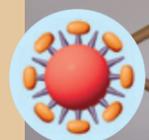
*1: While Plasmacluster can break down and remove the allergens on the surface of pollen as well as those discharged when the outer shell cracks open, it is not able to crack that outer shell and thus cannot break down and remove the allergens contained inside.
*2: ● Testing body: In-house testing ■ Test results: Initial potential of 4.0 kV decreased to 1.0 kV in approx. 7.5 minutes (Plasmacluster ion density: 25,000 ions/cm³).
*3: ● Testing body: Ishikawa Health Service Association ■ Test results: Elimination efficiency of 99.0% was reached in approx. 195 minutes (Plasmacluster ion density: 3,000 ions/cm³).

*4: ● Testing body: Japan Food Research Laboratories ■ Test results: Proliferation of adhering mold was controlled in 5 days (Plasmacluster ion density: 25,000 ions/cm³).
*5: ● Testing body: Japan Spinners Inspecting Foundation ■ Test results: The odor intensity level was reduced to 2 in approx. 60 minutes (Plasmacluster ion density: 20,000 ions/cm³) and to 2 in approx. 80 minutes (Plasmacluster ion density: 10,000 ions/cm³).
*6: ● Testing body: Japan Spinners Inspecting Foundation ■ Test results: The odor intensity level was reduced to 1.6 in approx. 4 hours (Plasmacluster ion density: 250,000 ions/cm³) and to 1.9 in approx. 6 hours (Plasmacluster ion density: 100,000 ions/cm³).
* Refer to the corresponding product catalog for details on each test method, etc.



Viruses

Some viruses possess "spikes" of proteins that project outward. They attach themselves to and invade such hosts as human cells and are thought to have a physiological effect that enables them to escape from the host's immune mechanism.



Airborne virus

Dust mite feces and dead dust mites Allergens

Among mites, it is said that the species Dermatophagoides easily plays the role of an allergen. Because they feed on human dandruff and grime, mites can proliferate on futons, pillows, and clothes where dandruff and grime easily adhere, and their remains and excrement can be found in abundance throughout the air.



Dust mite feces

Dead dust mites

A Word from the Developer 2

Our air purification systems put safety first.

Kazuo Nishikawa, Dept. General Manager, PCI Device Development Dept., Air Conditioning Systems Division Health and Environment Systems Group, Sharp Corporation



While an air purifier takes in air and uses a filter to remove toxic substances, the development of Plasmacluster technology began from the opposite concept: "Can't we purify every corner of the room through the release of some element?" However, it needed to be safe. What we looked at in that regard was the human immune system. When our white blood cells remove the miscellaneous germs, etc., that enter our body, they generate positive and negative ions. And we knew that similar ions also exist in the air. As we worked over and over to ensure that no toxic substances would be emitted, we finally developed the "Plasmacluster" technology that discharges the same ions as those that exist in the safe, natural world. We want to deliver comfortable air to all of the spaces in which our customers live through Plasmacluster, a technology for which we have confirmed its effective and beneficial mechanisms as well as its safety.



Airborne allergens like dust mite feces and dead dust mites are a problem

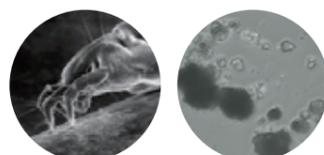
Airtight homes are a favorite environment of mites

Unlike olden times, modern living spaces have become more and more airtight due to the widespread use of aluminum

window sashes, etc., that prevent airflow from easily passing through. Walls are also blanketed with insulation and heat is easily kept locked inside. While this facilitates the protection of personal privacy and makes for a more comfortable living environment, it is also a very favorable environment for mites, etc., to thrive in as well.

Sun drying alone is not enough

Mite feces and dead mites become airborne throughout the room as "house dust". Though it is important to be diligent in drying bed sheets and carpets, etc., in order to prevent the number of mites from increasing, their dust mite feces and dead dust mites are still difficult to remove.



Dead dust mites

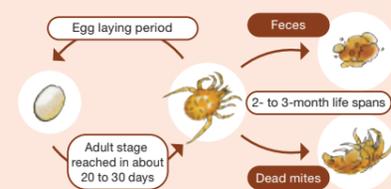
Dust mite feces

Removing dust mite allergens

The positive and negative ions discharged by Plasmacluster ion generators are transformed into OH radicals on the surface of airborne allergens such as dust mite feces and dead dust mites. These radicals cut through and remove the mite's proteins, reducing their effects*1.

Mites are amazingly fertile!!

Mites (Dermatophagoides) complete their life cycle every 2 to 3 months. During that time it is said that they lay about 100 eggs, and they breed explosively in the high temperature and high humidity environments that they have a preference for.



Controlling airborne viruses

(This refers to the effect after 10 minutes in a 1m³ airtight container and does not demonstrate the results in actual usage conditions.)

The dry season is when viruses are most active

When the air becomes dry, viruses become more active. It has become commonplace nowadays to see many

people around town wearing masks and taking other anti-virus measures.

Washing your hands and gargling are just common sense

Washing your hands with soap and gargling are important in the season when viruses proliferate.

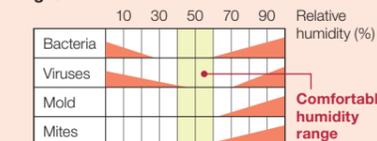
Suppressing the activity of the airborne viruses

Plasmacluster ions remove the proteins that project like spikes from the surface of airborne viruses, and suppress their activity*2. Furthermore, the effect actually improves the greater the ion density is.

Set the humidity to between 40 and 60%!!

Generally, mites and mold like high humidity, while viruses are active in the state of low humidity. The most comfortable, healthy environment is thus considered to be with the humidity between 40 and 60%.

Diagram of the correlation between relative humidity and microorganism growth



* Excerpt from an American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) report (1995)

*1: ● Testing body: Hiroshima University Graduate School of Advanced Sciences of Matter ■ Test results: Mite allergens suppressed in 4 weeks (Plasmacluster ion density: 3,000 ions/cm³)

*2: ● Testing body: Retroscreen Virology (U.K.) ■ Test results: Removal efficiency of 99.0% in approx. 10 minutes.

● Tests were conducted on a single species of virus.

● Products have functions to suppress the activity of airborne viruses, and to remove allergens such as dust mite feces and dead dust mites. However, these functions cannot produce sterile environment, and cannot guarantee that microbial infection will be prevented. ● Actual numbers of ions and disinfecting/purifying effectiveness will vary according to the room conditions (product installation location, air conditioner airflow volume, room size, shape, fresh air ventilation ON/OFF, etc.) and the product operation method.

* Refer to the corresponding product catalog for details on each test method, etc.

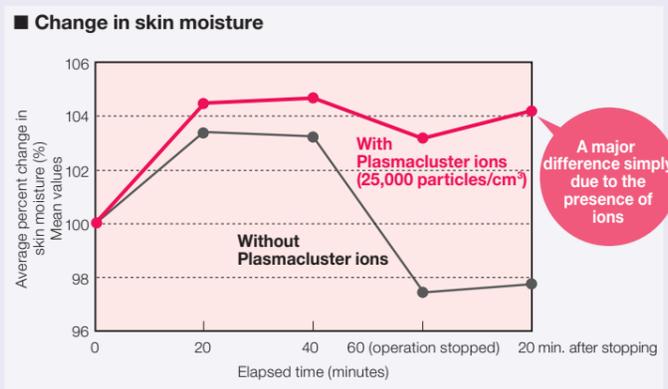


Is it True That High-Density Plasmacluster is also Beneficial for Maintaining Beautiful Skin?

Moisture Proven to preserve skin moisture.

Many people are bothered with dry skin, which can also result in a variety of other skin problems. A clear difference has been found in the skin's level of moisture maintenance in environments with or without Plasmacluster ions.

(Actual effect differs depending on the season, ambient environment [temperature/humidity], duration of use and the individual.)

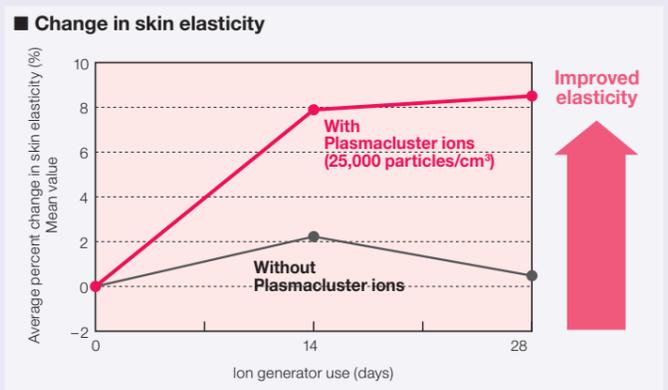


- Testing body: Soiken Inc. ● Test area: approx. 9.8m² floor area ● No. of test subjects: 13 (females, 20 to 60 years old) ● Temperature: approx. 28°C, Humidity: approx. 40%
- Ion density: approx. 25,000 ions/cm³ ● Test method: Test subjects entered a room where Plasmacluster ions were generated and a room where ions were not generated, and the rate of change in the amount of moisture in the skin at their temples was measured in a reclined state.
- Test results: After 60 minutes of operation, a significant statistical difference was seen in the skin moisture where ions were present in comparison to the environment without ions, and the skin's moisturizing action in the presence of Plasmacluster ions was thus confirmed.
- * The result was not due to humidification of the room.

Elasticity Improves elasticity of the skin

The skin's moisturizing action exerts a major influence on its elasticity. Tests have confirmed that Plasmacluster improves the elasticity of the skin. And, as we all know, supple skin is a nice thing to have.

(Actual effect differs depending on the season, ambient environment [temperature/humidity], duration of use and the individual.)



- Testing body: Soiken Inc. ● No. of test subjects: 24 (females, 30 to 65 years old) ● Ion density: approx. 25,000 ions/cm³ ● Test method: Plasmacluster ion generators were placed in actual living spaces having floor areas of approximately 9.8m² to 13.2m², the test subjects used the generators each day at bed time for 28 days, and the elasticity of the skin on their cheeks was measured.
- Test results: A significant statistical difference was seen in the rate of change in skin elasticity after 28 days, and improvement to the elasticity of the skin in the presence of Plasmacluster ions was thus confirmed.
- This result was from using test ion generators. It is thought that a similar effect is also achieved using a Plasmacluster air conditioner or ion generator, etc.

Texture Improves skin texture

When skin is damp, its texture changes. Plasmacluster's moisturizing action promotes smooth skin. And smooth, bare skin helps boost our confidence.

- Testing body: Soiken Inc. ● No. of test subjects: 24 (females, 30 to 65 years old) ● Ion density: approx. 25,000 ions/cm³ ● Test method: Plasmacluster ion generators were placed in actual living spaces having floor areas of approximately 9.8m² to 13.2m², the test subjects used the generators each day at bed time for 28 days, and the skin under the corner of their eyes was observed using a 30x magnification microscope.
- Test results: After 28 days, the fact that texture of the skin was smoother in comparison with before the Plasmacluster ion generators were used was confirmed.
- This result was from using test ion generators. It is thought that a similar effect is also achieved using a Plasmacluster air conditioner or ion generator, etc.



Moisture

Elasticity

Texture

3 Skin Beautifying Effects

Plasmacluster High-Density 25000*

Prof. Michio Niwano
Research Institute of Electrical Communication, Tohoku University

At first I was surprised how easily Plasmacluster ions encapsulated in water molecules adhered to the surface of the skin. But we then confirmed that the ions indeed did adhere easily to the skin's surface where proteins were present as well, and we were able to sufficiently confirm its moisturizing action on the skin. I highly anticipate that Plasmacluster technology will be used even more widely in the field of health.

(Excerpt from a technical release on June 4)

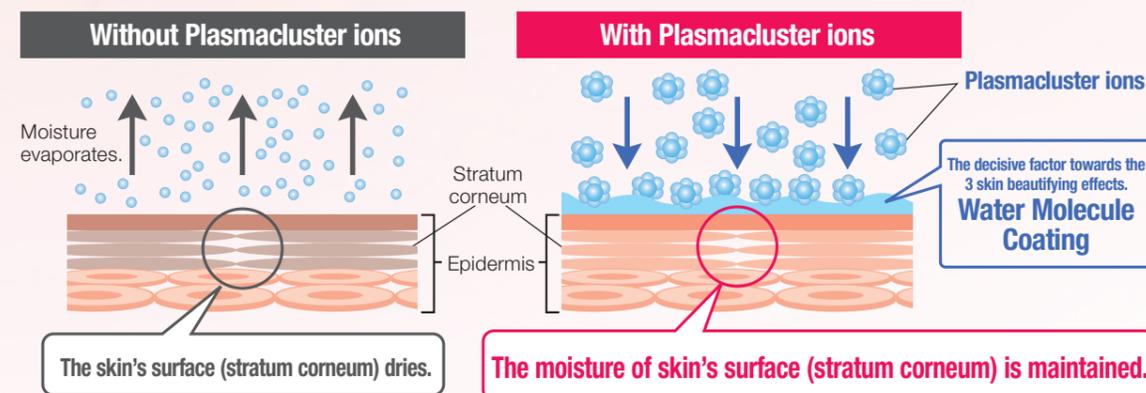
Tomohiro Sugino, President & Representative Director
Soiken Inc.

Following the test on the moisturizing action of the skin, we tested and verified the effect of improvement of Plasmacluster ions on skin elasticity and on promoting smoother skin texture. This indicates that Plasmacluster can surely be depended on as one measure of skin care, including for combating dryness.

(Excerpt from a technical release on June 4)

The Mechanism of Skin Moisturization

The water molecules that surround Plasmacluster ions adhere to the surface of the skin and form a Water Molecule Coating. This maintains the moisture of the skin's surface (stratum corneum).



(Image Diagram)

- Testing body: Research Institute of Electrical Communication, Tohoku University ● Ion density: approx. 25,000 ions/cm³ ● Test method: Plasmacluster ion generators were placed inside a spectrum analyzer that analyzes water molecules, and multiple internal reflection infrared spectroscopy was used to confirm the formation of a water molecule coating on the surface of a silicone plate that simulated skin both in the presence of ions and in an ion-free environment.
- Test results: The formation of a water molecule coating on the surface of the skin due to the presence of Plasmacluster ions was confirmed.

Excellent news for women!
It is indeed known that Plasmacluster helps to maintain the skin's moisture level, improves its elasticity, and acts to smoothen its texture.



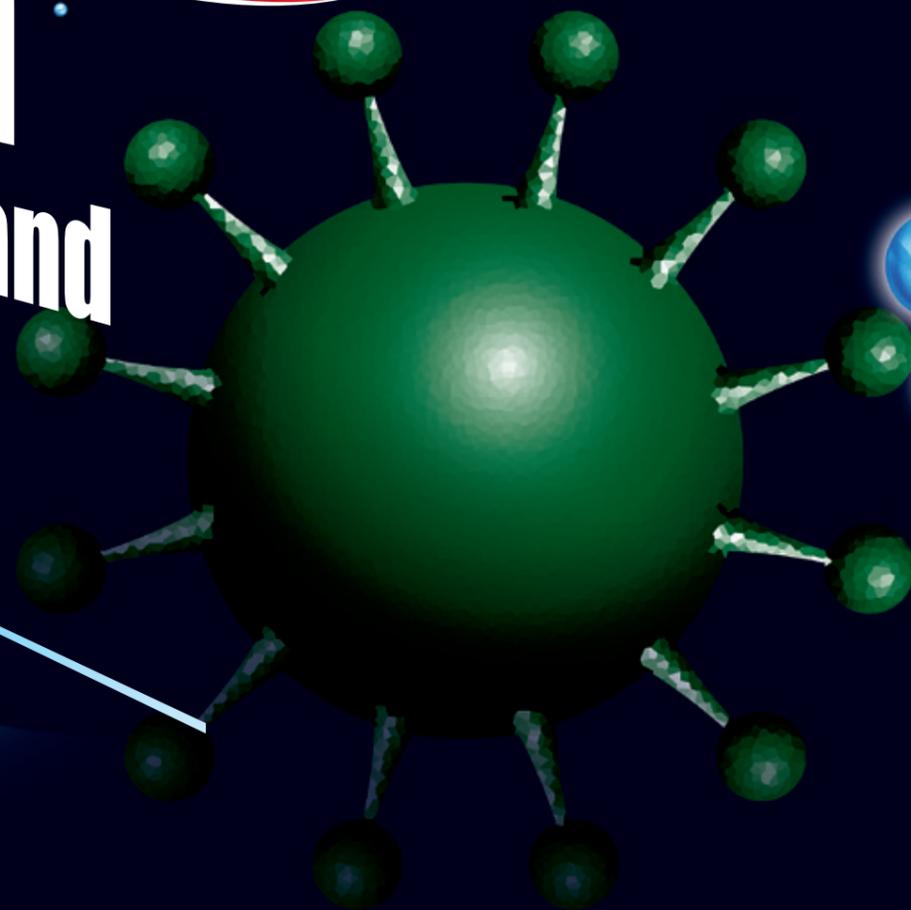
High-Density 25000*

* The number in this technology mark indicates an approximate number of ions supplied into the air of 1 cm³, which is measured around the center of a room with the applicable floor area (at 1.2 m height above the floor) at the maximum wind volume, when Plasmacluster ion evolving equipment using the high-density Plasmacluster ion evolving unit is placed close to a wall.



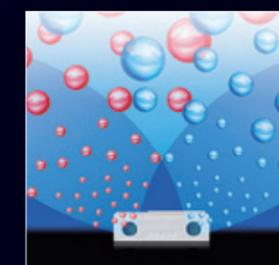
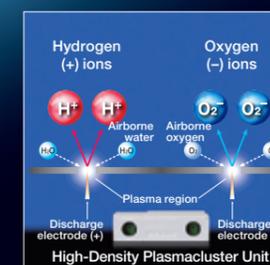
A Remarkable Mechanism for Suppressing Mold*¹ and Allergens*²

Plasmacluster Ions



1 Ions are discharged.

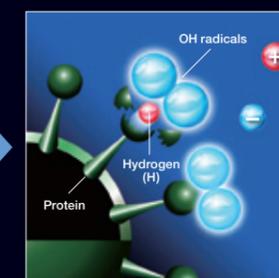
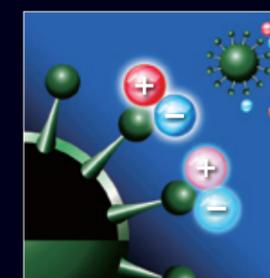
Plasmacluster ions are the same positive and negative ions found in nature. The ions are surrounded by water molecules, and are released into the air.



▲ Because water molecules encapsulate the plus and minus ions, they have a long life*.
* Verified in SHARP test comparisons to ions not surrounded by water molecules.

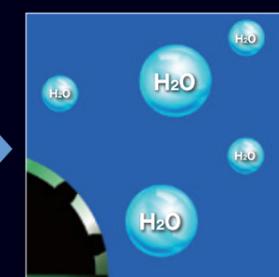
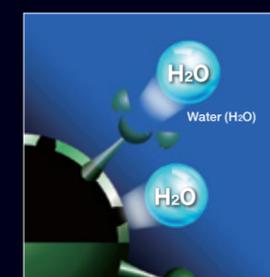
2 The ions act on airborne mold and airborne allergens.

The ions form OH radicals that are highly oxidizing only when they adhere to the surfaces of mold and viruses. They instantly remove the hydrogen from the surface proteins, breaking them down.



3 Return to the air as water.

The OH radicals combine with hydrogen (H) to form water (H₂O) which returns to the air.



What are ions?

"Ions" are those atoms and molecules – which make up physical matter – that possess a positive or negative electrical charge due to the attraction and discharge of electrons. An ion that has lost one or more electrons (and thus has more protons than electrons) is said to have a positive (+) charge and one that has gained electrons (having more electrons than protons) is said to have a negative (-) charge. It is said that, in olden times, a scientist

experimenting with electrolysis discovered extremely small matter with an electric charge flying toward an electrode, and called it an "ion", which meant "to go" or "that which moves", etc., in ancient Greek.

What is the origin of the Plasmacluster name and logo mark?

Plasma is electrically charged gas. It is produced through an electrical discharge

(plasma discharge) in a gas. Auroras, such as at the North Pole, are representative phenomenon. The plasmacluster ion generating device releases hydrogen (+) ions and oxygen (-) ions through plasma discharge, with the generated ions surrounded by water molecules. This form was thus given a name that includes both "plasma" and "cluster" (like a cluster

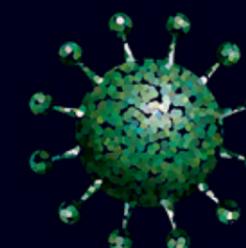


of grapes). A special feature of these Plasmacluster ions surrounded by water molecules is their long life spans.

What is the mechanism of Plasmacluster ions?

Plasmacluster ions differ from general disinfection systems in that they change into "OH radicals" on the surface of molds and viruses, etc. The ions form OH radicals that are highly oxidizing only when they adhere to the

surfaces of mold and viruses. The instantly remove the hydrogen from the surface proteins, breaking them down. The OH radicals combine with hydrogen (H) to form water (H₂O) which returns to the air.



*¹ Verified by Prof. Artmann, Aachen University of Applied Sciences, Germany
*² Verified by Hiroshima University Graduate School of Advanced Sciences of Matter



What Special Power Does Plasmacluster Possess?

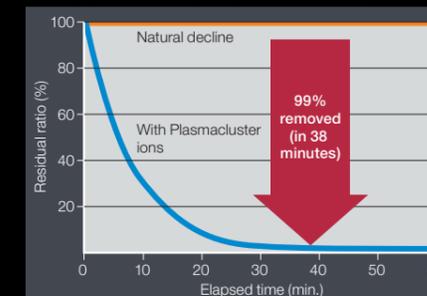


2

Suppresses the activity of airborne microbes*2

We worry about airborne microbes in the dining room where everyone gathers for meals. Plasmacluster decomposes the protein in the cell membranes on the surface of airborne microbes, thus suppressing its activity in about 38 minutes.

Rate of residual airborne microbes



Plasmacluster ions reach a wide area for places where everyone gathers.

Plasmacluster ion generator: IG-BL20 (for an approx. 20m² floor area)

Recommended for those who want:

- to clean the air in spacious rooms.
- to concentrate on hygiene in places where food is handled.



*2: Verified in a test area of approx. 16.3m² ● Testing body: Harvard School of Public Health (U.S.A.) Prof. Emeritus Melvin First
■ Test results: Removal efficiency of 99.0% was reached in approx. 38 minutes (Plasmacluster ion density: 4,700 ions/cm³)

1

Suppresses the activity of airborne viruses

(This refers to the effect after 10 minutes in a 1 m³ airtight container and does not demonstrate the results in actual usage conditions.)

We naturally worry about the existence of airborne viruses where many people gather, such as living rooms. Plasmacluster breaks down the spike-like projections of protein on the surface of airborne viruses*1 to suppress the activity of those viruses.



Healthy air conditioning means avoiding direct wind and delivering a comfortable current of air

Air conditioner: AY-Z50SX

Recommended for those who want:

- a fresh breeze with no worries of odor when using the air conditioner.
- clean air in the room when air conditioning is not required.



*1: ● Testing body: retroscreen Virology (U.K.) ● Test method: Viruses were suspended in the air inside a 1-m³ box, and the percentage of airborne viruses removed was measured.
■ Test results: Removal efficiency of 99.0% in approx. 10 minutes.
● Tests were conducted on a single species of virus.
(This test displays the effect after 10 minutes in a 1 m³ airtight container and does not demonstrate the results in actual usage conditions.)

3

Acts on both airborne and adhering mold

Most everyone has experienced the shock at least once of finding mold growing on food or their favorite shoes, etc. In addition to naturally decomposing and removing airborne mold*3, a Plasmacluster ion with 25,000 ions/cm³ high density also suppresses the proliferation of adhering mold*4 and plays an active role in places where mold is a serious concern, like kitchens and lavatories, as well as entryways on a rainy day.

A compact design that's easy to use for preventing mold in damp, humid places.

Plasmacluster ion generator: IG-CL15 (for an approx. 15m²)

Recommended for those who want:

- to prevent mold in places easily get humid.
- to carry around in the room

(Optional battery case [sold separately] required)



One-Point Lifestyle Advice

It's important to prevent mold!

The spores of mold microbes are airborne in the air all around us. Once it gets a foothold, mold is a formidable opponent and extremely difficult to get rid of, so it is very important to habitually try to avoid and prevent the high humidity environments that mold likes. Be especially careful for mold in changing rooms, lavatories, kitchens, and closets where moisture is easily trapped.

*3: ● Testing body: Ishikawa Health Service Association
● Test results: Removal efficiency of 99.0% in approx. 195 minutes (Plasmacluster ion density: 3,000 ions/cm³)
*4: ● Testing body: Japan Food Research Laboratories ● Test results: Proliferation of adhering mold suppressed in 5 days (Plasmacluster ion density: 25,000 ions/cm³)

* The indicated models are representative of Plasmacluster products. Refer to the corresponding product catalog for details on each product and each test method, etc.

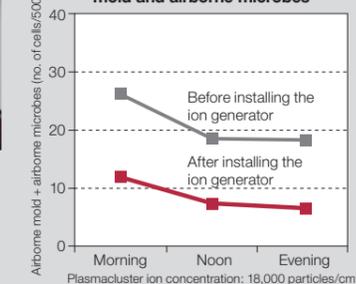
● Products equipped with Plasmacluster suppress the activity of airborne viruses and have the function to decompose and remove allergens, etc., like dust mite feces and dead dust mites. However, this does not result in a totally aseptic environment and does not guarantee that transmission and/or infection will be prevented.
● The actual number of ion particles and the bacteria elimination and purification effect will differ depending upon the actual situation in the room (the size, shape, whether an air conditioner and ventilation, etc., are used or not, the location of product installation, etc.) and the method of use (direction of ion dispersal, selected operation mode).
● To ensure steady emission of high-density Plasmacluster ions, the Plasmacluster ion generating units mounted in products with high-density 25,000 ions/cm³ need to be replaced periodically.

Example of the effect of a decrease in airborne mold and other microbes in a building entrance

Entrance hall and ion generator installation



Result of measurement of airborne mold and airborne microbes



Airborne mold and other microbes decreased due to the installation of a Plasmacluster ion generator.

● Testing body: SHARP in-house testing ● Test method: An air sampler (500 L of suction) was used to gather airborne mold and airborne microbes. The amount of airborne mold and airborne microbes was compared with the ion generator turned on (high setting) and with the generator off. ● Test period and conditions: Implemented February 2009, (4 measurements each), temperature: 20.1°C, humidity: 26.6%, room dimensions: 17.8 x 8.7 x 5.4 (H) m = 836 m³

What Special Power Does Plasmacluster Possess?



New Standard for Clean Air
Plasmacluster – Only from SHARP

4

Decomposes and removes airborne allergens like dust mite feces and dead dust mites*1

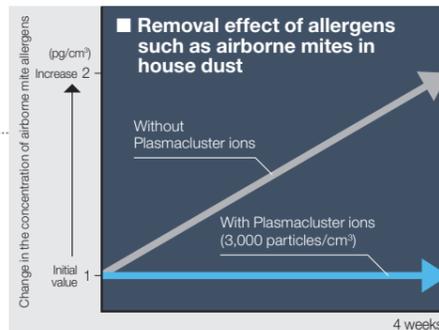
It is said that the pollen and house dust that is airborne during the day settles and accumulates in our bedding when we go to bed and get up. Mites also lurk in our carpets, tatami mats, and bedding. Because Plasmacluster removes the allergens of airborne dust mite feces and dead dust mites, it is a perfect fit as a countermeasure to allergens, especially for small children.

Captures pollen and dust mite feces and dead dust mites through a synergistic effect with the filter

■ Air Purifier with humidifying: KC-860

Recommended for those who want:

- to remove airborne allergens such as pollen and dust mite feces and dead dust mites.
- to continuously maintain a comfortable level of humidity and clean air.



■ Removal effect of allergens such as airborne mites in house dust

Without Plasmacluster ions
With Plasmacluster ions (3,000 particles/cm³)

Proliferation suppressed

4 weeks



*1: ● Testing body: Hiroshima University Graduate School of Advanced Sciences of Matter
■ Test results: Mite allergens suppressed in 4 weeks (Plasmacluster ion density: 3,000 ions/cm³)

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Decomposes and removes adhering odors*2

Cigarette and pet odors may not be noticeable to the actual user or owner and their family, but they can be very troublesome to those who are sensitive to those smells. Plasmacluster decomposes and removes cigarette and pet odors that are ingrained in the room, as well as the smell of room-dried laundry.

Reliable air purification in a compact body

■ Plasmacluster Ion Generator: IG-A10 (for an approx. 10m²)

Recommended for those who want:

- to eliminate cigarette and pet odors.
- to get rid of the odor of sweat ingrained in suits and shoes.



*2: Deodorizing effect on adhering cigarette odors
● Testing body: Japan Spinners Inspecting Foundation
■ Test results: Odor intensity level was reduced to 2 in approx. 60 min (Plasmacluster ion density: approx. 20,000 ions/cm³)

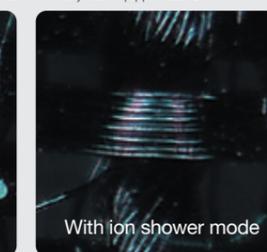
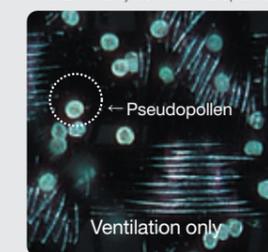
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Removes static electricity*3

many of you have had that unpleasant experience of the "crackle" of static electricity the moment we touch a doorknob or put on a sweater. Plasmacluster removes that static electricity, and does so faster through humidification.

■ Static electricity removal performance of an air purifier with humidifying

Ventilation alone does not remove adhering pollen from cloth. Static electricity was removed and pollen was removed by units equipped with an ion shower mode.



● Test method: Pseudopollen was applied to cloth charged with static electricity, and the cloth was then exposed to Plasmacluster ions. After patting the cloth several times, a photograph was taken using an electron microscope.

As a countermeasure to pollen and dust adhering to hair and clothes

■ Air Purifier with humidifying: KC-850

Recommended for those who want:

- to keep pollen and dust outside.
- to remove static electricity.



*3: Testing body: SHARP in-house testing
● Test results: Initial potential of 4.0 kV decreased to 1.0 kV in approx. 13 minutes.

One-Point Lifestyle Advice

Natural fabric and humidification: Countermeasures against static electricity

One worry that winter brings is static electricity. The main cause of this is material such as nylon and polyester. Static electricity is generated because these materials do not conduct electricity easily and thus hold that electrical charge. To prevent this, it is suggested that we choose clothing made of natural fabrics such as cotton and linen on which static electricity does not easily accumulate. Moreover, because static electricity is easily generated when the air is dry, it is important to use a humidifier, etc., to maintain the humidity in the room.

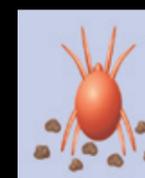
* The indicated models are representative of Plasmacluster products. Refer to the corresponding product catalog for details on each product and each test method, etc.

● Products equipped with Plasmacluster suppress the activity of airborne viruses and have the function to decompose and remove allergens, etc., like dust mite feces and dead dust mites. However, this does not result in a totally aseptic environment and does not guarantee that transmission and/or infection will be prevented.
● The actual number of ion particles and the bacteria elimination and purification effect will differ depending upon the actual situation in the room (the size, shape, whether an air conditioner and ventilation, etc., are used or not, the location of product installation, etc.) and the method of use (direction of ion dispersal, selected operation mode).
● To ensure steady emission of high-density Plasmacluster ions, the Plasmacluster ion generating units mounted in products with high-density 25,000 ions/cm³ need to be replaced periodically.

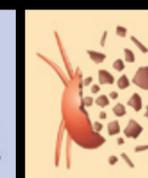
Did You Know?

You can't relax even when mites are dead!

Mites breed by eating mold and pieces of human waste matter, etc. Because they consume human waste matter, etc., they cannot necessarily be considered all bad. The problem is dust mite feces and dead dust mites, the pieces of which become airborne as allergens.



Dust mite feces



Dead dust mites

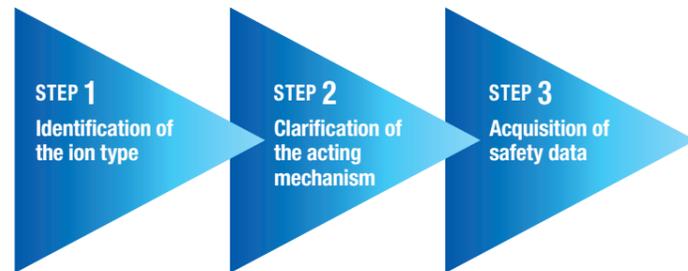
How about Safety?

The Proof of the Effectiveness and Safety of High-Density Ions

The same air purification system as in the natural world

Plasmacluster uses the water molecules and oxygen that are readily present in the air as its base material to produce the same plus and minus ions as those that exist in the natural world. These plus and minus ions are found in abundance and in perfect balance on highlands and in forests where air is fresh and clean. We can surely say that Plasmacluster is a method of purifying the air that offers us the same assurances as does the natural world.

Only with Plasmacluster: Confirmation of safety possible in 3 simple steps



STEP 1 Identification of the Plasmacluster ion type

It has been confirmed that Plasmacluster ions are the same type of ions as those that exist in the natural world.

STEP 2 Clarification of the acting mechanism

It has been confirmed that Plasmacluster ions react only with the protein on the surface of airborne bacteria and do not influence the internal cytoplasm, etc.

• Prof. Artmann, Aachen University of Applied Sciences, Germany

STEP 3 Acquisition of safety data

High reliability safety data has been acquired from GLP-compliant* (Good Laboratory Practices) testing facilities.

| Purpose | Test name (abbreviation) | Ion density setting |
|-------------------------------------|--|--|
| Skin Irritation (General Condition) | Acute Skin Irritation/Corrosion | Approx. 1,000,000 particles/cm ³ |
| Eye Irritation (General Condition) | Acute Eye Irritation/Corrosion | Approx. 13,000,000 particles/cm ³ |
| Gene Toxicity (General Condition) | Inhalation Toxicity (Evaluation of Genetic Effect on Pulmonary Tissue) | Approx. 7,000,000 particles/cm ³ |

● Testing body: Mitsubishi Chemical Medience Corporation

* GLP (Good Laboratory Practices) refers to a set of management control principles that regulate testing facilities and test procedure manuals, etc., to ensure the reliability of studies conducted to assess the safety of chemicals, etc.

Plasmacluster's effect has been verified by leading science research laboratories both in Japan and abroad.



* Results of verification tests held at the same verification organization and during the same time period in regard to another toxic substance is omitted. (Verification data and usage results are for Plasmacluster ion units produced between October 2000 and the end of March 2010.)

| Allergens (Mite excrement and remains) | Mold bacteria | Viruses | Bacteria |
|---|---|--|--|
| Airborne allergens <ul style="list-style-type: none"> Hiroshima University Graduate School of Advanced Sciences of Matter Biochemistry and Molecular Pathology, Graduate School of Medicine, Osaka City University | Airborne mold bacteria <ul style="list-style-type: none"> Ishikawa Health Service Association Prof. Artmann, Aachen University of Applied Sciences (Germany) Adhering mold bacteria <ul style="list-style-type: none"> Medical School of Luebeck (Germany) Japan Food Research Laboratories | Airborne viruses <ul style="list-style-type: none"> Kitasato Research Center of Environmental Sciences Seoul National University (South Korea) Shanghai Municipal Center for Disease Control and Prevention (China) Kitasato Institute Medical Center Hospital, Kitasato Institute Retroscreen Virology (U.K.) Adhering viruses <ul style="list-style-type: none"> Retroscreen Virology (U.K.) | Airborne bacteria <ul style="list-style-type: none"> Ishikawa Health Service Association Shanghai Municipal Center for Disease Control and Prevention (China) Kitasato Research Center of Environmental Sciences Kitasato Institute Medical Center Hospital, Kitasato Institute Prof. Artmann, Aachen University of Applied Sciences, Germany Prof. Emeritus Melvin First, Harvard School of Public Health (U.S.A.) Adhering bacteria <ul style="list-style-type: none"> Kitasato Institute Medical Center Hospital, Kitasato Institute |
| Adhering odors <ul style="list-style-type: none"> Japan Spinners Inspecting Foundation | Skin <ul style="list-style-type: none"> Soiken | | |

Plasmacluster: Acknowledged by professionals and used in various corporations.



New Standard for Clean Air
Plasmacluster – Only from SHARP

Applications for Plasmacluster ions continue to expand



The effectiveness, merits and safety, etc., of Plasmacluster are evaluated highly by corporations in other businesses and, starting with INAX shower toilets, Plasmacluster has been adopted by companies handling a wide range of products such as a residential gas and household devices and automotive equipment. The official number of companies using Plasmacluster has grown to 24 at the present time and the applications for Plasmacluster ions are continually expanding in various locales and areas that people congregate in and utilize, such as buses and trains as well as public spaces like offices, hospitals, nursing facilities, hotels, and schools.

Residential equipment and devices

Plasmacluster is active in places familiar to all, such as residences that support comfortable living conditions.

| | | |
|--|--|--|
| Lighting | | |
| Gas fan heaters | | |
| Air purifiers | | |
| Gas fan heaters and circulating hot water-type bathroom air-conditioning dryers | | |
| Gas fan heaters and circulating hot water-type bathroom air-conditioning dryers | | |
| Gas fan heaters | | |
| Gas fan heaters | | |
| Gas fan heaters | | |
| 24-hour ventilation system and electric bathroom air-conditioning ventilation dryers | | |
| Electric bathroom air-conditioning ventilation dryers | | |
| Building-wide air-conditioning systems | | |
| Mist saunas | | |
| Shower toilets | | |

Automotive and transportation related equipment

Plasmacluster technology is useful in automobiles, buses, and trains that serve as transportation for the public.

| | | |
|---|--|--|
| Automotive air conditioners and air purifiers | | |
| Automotive air conditioners and air purifiers | | |
| Air conditioners for automobiles | | |
| Ion generators for automobiles | | |
| Air conditioners for buses | | |
| Air conditioners for buses | | |
| Air purification systems for trains | | |

Business equipment

Plasmacluster technology is employed in support of comfortable business environments.

| | | |
|---|--|--|
| 24-hour central floor ventilation systems | | |
| Ion duct transport systems | | |
| Elevators | | |
| Systems for smoking areas | | |
| Air sanitizers | | |

Restaurants and Cafes

Kentucky Fried Chicken Japan Ltd.

Advancing measures to reduce offensive odors like cigarettes and create more comfortable spaces in separate smoking areas

Though our company had tried using photocatalysts and filtration-type air purifiers, etc., with a deodorizing effect, we couldn't eliminate the cigarette smell that remained in our restaurants. A great deal of time and money was spent on maintenance, so we decided to employ Plasmacluster.

The manager of one of our restaurants in which it was installed clearly felt the effect: "Odors that we could not remove through our normal cleaning procedures alone were no longer a problem," and "When we used Plasmacluster at night, the air was completely different the next morning." The reduced smell of cigarettes is popular with our regular customers as well.



■ Plasmacluster Ion Generator
... IG-840

Taxi Companies

Sogotaxi Co., Ltd.

Eliminating in-vehicle odors supports enhanced passenger service

Odor measures in place for our company's vehicles included opening the windows for ventilation as soon as each customer exited the vehicle, but that was not sufficient. Anti-virus measures as well had only gone as far as distributing masks to the drivers for the purpose of customer safety. Due to this, the in-vehicle type of Plasmacluster unit was selected for its high effect on controlling viruses and the corresponding highly reliable safety data that had been acquired.

Following installation, we were featured by the mass media as an "odor-free and sanitary, comfortable taxi", thus contributing to our differentiation with other companies.



■ Plasmacluster Ion Generator
... IG-BC15 (142 units)

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Interesting Places You'll Find Plasmacluster!

Installation Examples ①



■ Plasmacluster Ion Generator ... IG-840 (260 units)
■ Air Purifier Humidifier ... KC-M650 (260 units)

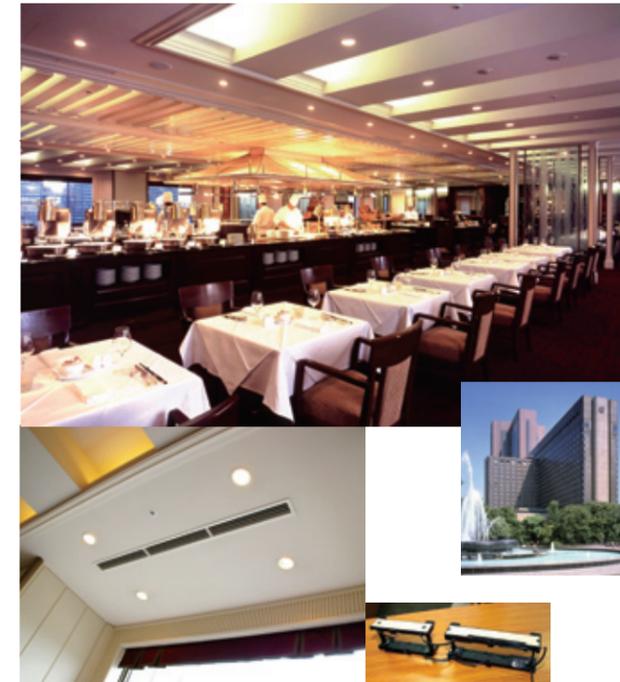
Children's English Conversation Classes

Amity Co., Ltd.

Providing clean air for children's health

A great many children attend our English conversation classes, from toddlers less than 1 year old to high school students, and even including the fetuses of pregnant women! But our company felt that continuing only with what we had always been careful about, like gargling, washing hands, strict implementation of ventilation measures, and installing humidifiers, etc., was insufficient in terms of the air environment.

And what we focused on when selecting a product in that regard was safety. Whatever electronics store we talked to, they all said that Sharp had a reputation for proven safety and excellent effect. So, we decided to install Plasmacluster. We have received words of appreciation, one by one, from our staff, as well as praise from all parents and guardians. Selecting Sharp quality is typical of the excellence Amity delivers.



■ Air-Conditioning Duct Installation-Type Plasmacluster Ion Generation Unit System
... Installed in some restaurants and guest rooms

Hotels

Imperial Hotel Ltd.

Installing Plasmacluster in the air-conditioning system means even the air is handled in the spirit of true Imperial Hotel service

The air is part of a hotel's product. The goal of providing even air that is considered in the spirit of true Imperial Hotel service was something our company was looking to when we learned about high concentration Plasmacluster technology. Instinctively we knew how amazing the technology was and asked for a detailed explanation. As a result, joint development of the Air-Conditioning Duct Installation-Type Plasmacluster Ion Generation Unit System for ceiling installation was begun, and we are now able to easily adjust the ambient environment even without bothering guests. Maintenance is also simple because the frequency of parts replacement is minimal, and, when necessary, can be accomplished from inside the rooms.

Animal Hospitals

Yamane Animal Hospital, Kurayoshi Animal Medical Center

Aiming for an ambient environment that is kind to both animals and people

A new hospital was completed in Kurayoshi City (Tottori Prefecture) for the purpose of serving as a central facility for that area. Because many animals enter and exit a veterinary hospital, sanitary control and odor management were important issues, and Plasmacluster was introduced here as one of those measures. Naturally, this was due to its effect, but what was also very attractive to us was the ability to provide a comfortable environment for the animals, their owners, and our staff as well. Plasmacluster units were installed in almost all areas, such as the waiting room, treatment rooms, and hospitalization rooms. Plasmacluster air conditioners with automatic filter cleaning function were also enthusiastically introduced, making it possible to offer treatment in a clean ambient environment, with everyone involved quite satisfied.



■ Plasmacluster Ion Generator
... IG-840 (12 units), IG-820 (7 units) and IG-B100, etc.

Playing an Active Role in Diverse Locations

Installation Examples ②



■ Plasmacluster Ion Generator ... IG-840 (1 unit) and IG-820 (4 units)

Dental Offices

YAS Dental Clinic

Hygiene, even in the air, by installing Plasmacluster

Patients from a wide range of age groups come to our clinic for general and pediatric dentistry all the way through to prevention, correction and implants. Our aim is to utilize the most advanced equipment and technology, and offer a clean, comfortable environment for patients to use, so we quickly introduced Plasmacluster ion generators to construct a clean air environment specifically in the waiting room and the children's room that serve as the outpatient entrance.

Wanting the ion generator to also provide the diagnosis, treatment and reception staff, who come in close contact with patients, with a comfortable ambient environment as well, we installed units in multiple places around the clinic. The constant comfort of clean air is now popular with our staff as well as the patients.

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Many Customers Have Experienced the Effects



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Air Purifier Humidifier

For clean, fresh air

■ Ms. Uoo (Osaka Prefecture)
We selected a Plasmacluster air conditioner and put it in our baby's room in order to control the environment there. It removes the odor when changing diapers.

■ Ms. Nakagawa (Tokyo Prefecture)
When friends come over, they say, "The air in your house smells wonderful". At night we move the Plasmacluster to our children's room and use it there. I'm really glad we bought it.

Air Conditioner

■ Mr. Tashiro (Saitama Prefecture)
Because I use my car for work and for private use as well every day, I was concerned with the smell. So I bought a Plasmacluster. It eliminates the smell almost immediately after I eat a meal in the car, and I notice the difference the moment I open the door.

For house dust

Air Purifier Humidifier

■ Ms. Tokuda (Tokyo Prefecture)
I bought a Plasmacluster because it felt like the air in our house was polluted with house dust, etc. It was also good to get rid of the cigarette smell. This is an absolute necessity in our home.

Ion Generator

■ Ms. Ikou (Shiga Prefecture)
We have a lot of visitors, so I was concerned about room odors and I bought a Plasmacluster as a matter of etiquette. I really like it because it's also effective on cigarette odors.

Air Conditioner

■ Ms. Tajiri (Kyoto Prefecture)
Our child is still small, and we bought a Plasmacluster because we heard it would clean the air beautifully. My father smokes and I feel like it has reduced that smell as well.

For pet odors

Air Conditioner

■ Mr. and Mrs. Kawahito (Osaka Prefecture)
People who dislike dogs seem to be very conscious about dog odors. Once we installed this Plasmacluster, the smell was clearly lessened, and we feel like the air is now indeed clean.

For cigarette odors

Air Purifier Humidifier

■ Mr. and Mrs. Yoshitake (Nara Prefecture)
Before, our neighbor mentioned of the cigarette smell in our room. The smell was very strong that we actually feel it. After we bought this Plasmacluster, the smell disappeared.

Air Purifier Humidifier

■ Ms. Hirose (Osaka Prefecture)
We leave the Plasmacluster on all the time, all-year around. It eliminates pet and cigarette smells and is just a great help. We have two in the living room, and one in our child's room and in our bedroom.

Ion Generator

■ Ms. Yoshihara (Wakayama Prefecture)
Even visitors who don't have a cat say they don't notice the smell, so I think my cat's smell has indeed been eliminated. The Plasmacluster takes an active part in cleaning our home since we leave it on all summer and winter, 365 days a year.

Ion Generator

■ Mr. and Mrs. Nakatani (Osaka Prefecture)
Though the smell of our dog permeated throughout the room, it got better in just half a day. So we added a Plasmacluster in our child's room and some other rooms.

Air Purifier Humidifier

■ Ms. Kouno (Aichi Prefecture)
I bought a Plasmacluster with the thought of improving the environment for our child. When I used the Plasmacluster for room drying our laundry, that peculiar and unpleasant smell of drying laundry went away.

For laundry odors