

Ionaire – Plasma Air Purifiers

Kills Virus, Bacteria, Mold.....removes Allergens & Odours

Frequently asked Questions & Detailed explanation

How does Ionaire – Plasma work?

Ionaire - Plasma is a gas-phase purification technology that emits a blend of positive and negative ions that attract oppositely charged contaminants, building heavy clumps that fall out of the air. More importantly, these ions work to deactivate single-celled organisms such as, viruses, bacteria and fungi in the air or on surfaces. Simply put, the ions steal away hydrogen from the pathogens, leaving them to die.

How is this technology different from the standard filter based air purifiers?

Conventional filter type air cleaners can remove dust and particulates such as pet dander, but they have little effect on finer particulates such as viruses, bacteria, smoke, molds and mildew. The most dangerous particulate sizes are less than 10 micrometers and when inhaled, they can reach deep down into our lungs and even into our bloodstreams. A fan-type air filter can *only* filter the air that is drawn through it, whereas ions disperse all over the room and **neutralise the contaminants in the space where you breathe**. Only plasma ions with an Electron Volt Potential under twelve (eV<12), can deactivate and electrochemically break down these threats, into harmless compounds such as oxygen, nitrogen, water vapor and carbon dioxide.

What are the other USP over conventional air purifiers?

- Whisper silent operation
- No expensive filters, bulbs/cells to replace
- User-replaceable Plasma emitters
- Zero maintenance and very low operating cost
- Room windows can be left open or closed

What is a Plasma?

Plasma the fourth state of matter (solid, liquid, gas, and plasma) is created when a gas is heated sufficiently or exposed to a strong electromagnetic field. When a gas becomes a PLASMA it becomes unstable, thus producing bi-polar ions. Common examples of manmade plasmas include neon signs, fluorescent lamps, plasma displays used for televisions, plasma lamps. Naturally occurring plasmas include fire, lightning, the sun, and auroras. These Bi-polar ions are the same as what occur in nature. After purifying the air, the ions turn into harmless water vapour.

How are Bi-polar ions generated?

Through plasma discharge generated by applying voltage to special electrodes, positive hydrogen ions (H⁺) and negative oxygen ions (O₂⁻) are generated from the water and oxygen in the air.

Aren't Bi-polar ions the same as Negative ions?

No, negative ions are oxide ions created from oxygen molecules only. They spread in the room and surround dust particles and allergens to make them heavier to fall down. The allergens fall all over the place including our bodies, clothes and food. However, the ions have a short life so some of the allergens may return to the air. Bipolar ions are created from water vapour and oxygen in the air. Recent research at Yonsei University, Seoul, Korea has shown that bipolar ion treatment is nearly twice as effective in disinfecting the air than unipolar anions.

What is eV and why is it significant?

Every gas in the atmosphere has an electron volt potential. Understanding this eV value is critical when designing air purification systems to produce the desired effect, while avoiding the formation of ozone and other by-products such as aldehydes. While VOCs such Formaldehyde having an eV of 10.88 or Ammonia with an eV of 10.07 are easily broken down into harmless substances, Ozone formation is prevented by limiting the output to 12 eV.

What is the Mechanism of virus destruction by Plasma ions?

The coronavirus is covered in spikes (peplomers) which are a protective protein surface. Bi-polar ions attack that surface protein and change into hydroxyl (OH) radicals which in turn extract a hydrogen molecule from the virus thereby killing it. The end residual product is just water vapour.

Are these claims scientifically proven?

The effect and benefits of air-ions has been extensively researched and proven over the last 80 years. Tests in Labs worldwide have shown over 99% reduction of both aerosolized and surface micro-organisms. Bi-Polar Air ions in high concentration can substantially reduce mold, and pathogens such as, Clostridium Difficile, Staphylococcus, Methicillin-resistant staphylococcus aureus, EColi, and Legionella. Also proven to deactivate corona viruses like H5N1, H1N1, SARS, MERS. *We will be happy to provide you with Scientific & Research papers on the subject.*

Can you give an example of lab testing?

Kitasato Institute Medical Center Hospital, one of the world's most prestigious viral research organizations, has verified the action of plasma ions in inactivating the corona virus (FCoV), a member of the corona virus family. The results demonstrated that 99.7% of the virus is rendered inactive within 40 minutes.

Is this safe for healthy human cells?

Since this occurs only on the surface protein layer and does not affect DNA, the plasma ions will not harm healthy cells in the body. Viruses and bacteria have different structure than healthy human or animal cells. This is why you can take an anti-biotic to help kill an infection without harming yourself. Unlike other physical and chemical agents, such as UV light, ozone, radioactivity and use of caustic chemicals, BPI is totally GREEN and it does NOT adversely affect the environment in any way.

Additional benefits

Reduces Airborne Particles

Ions attach to airborne particles like dust, dander and pollen, substantially increasing their mass and size. This allows the air filtration system to easily capture the larger particles, increasing the capture efficiency of the HVAC system or existing air-filter.

Breaks Down Volatile Organic Compounds (VOCs) and Neutralizes Odors

Ions break down toxins and volatile organic compounds (VOCs) like Formaldehyde, into their basic elements. VOCs are compounds that easily become vapours or gases and can pose a threat to those who ingest or come into contact with them. VOCs are released from things like burning fuel, cigarettes, solvents, cleaning products, pesticides, paints and other household products and even human sweat and urine. For example, Ionaire can breakdown the VOC Ammonia (NH3) into harmless nitrogen, hydrogen, and water vapour. This process leaves the indoor air fresh and free of odour.

Increases Energy Savings in Air-conditioned spaces

In addition to health benefits, this technology can save upto 30% on air-conditioning costs by reducing the need for fresh outside air to maintain air quality.

Removes harmful static electricity

A useful side-benefit of this technology is the neutralization of Static electricity, thereby preventing pollen and airborne dust from clinging to curtains, clothing and other room surfaces. Simply put, Plasma ions bond with substances of opposite polarity by mutual attraction and eliminate any harmful static charge.

EFFICACY OF PLASMA IONS ON VARIOUS PATHOGENS		
Target Substance	Species	Testing and Verification Organization
Fungi	Cladosporium (black mold, mildew)	Ishikawa Health Service Association Universitätsklinikums Lübeck University Clinic (Germany) (proliferation control effect) CT&T (Professor Gerhard Artmann, Aachen University of Applied Sciences)
	Penicillium, Aspergillus	Universitätsklinikums Lübeck University Clinic (Germany) (proliferation control effect)
	Aspergillus, Penicillium (two species), Stachybotrys, Alternaria, Mucorales	CT&T (Professor Gerhard Artmann, Aachen University of Applied Sciences)
	Coliform bacteria (E. Coli)	Ishikawa Health Service Association
Bacteria	E. coli, Staphylococcus (aureus), Candida	Shanghai Municipal Center for Disease Control and Prevention, China
	Bacillus subtilis	Kitasato Research Center of Environmental Sciences CT&T (Professor Gerhard Artmann, Aachen University of Applied Sciences)
	MRSA (methicillin- resistant Staphylococcus aureus)	Kitasato Research Center of Environmental Sciences Kitasato Institute Medical Center Hospital
	Pseudomonas, Enterococcus, Staphylococcus	Universitätsklinikums Lübeck University Clinic (Germany) (proliferation control effect)
	Enterococcus, Staphylococcus, Sarcina, Micrococcus	CT&T (Professor Gerhard Artmann, Aachen University of Applied Sciences)
	Viruses	H1N1 influenza virus
H5N1 avian influenza virus		Retroscreen Virology, Ltd.
Coxsackie virus (summer colds)		Kitasato Research Center of Environmental Sciences
Polio Virus		Kitasato Research Center of Environmental Sciences
Corona Virus		Kitasato Institute Medical Center Hospital
Allergens		Mite allergens (dead bodies and feces)
	Pollen	Hiroshima University