

iWave AIR PURIFICATION

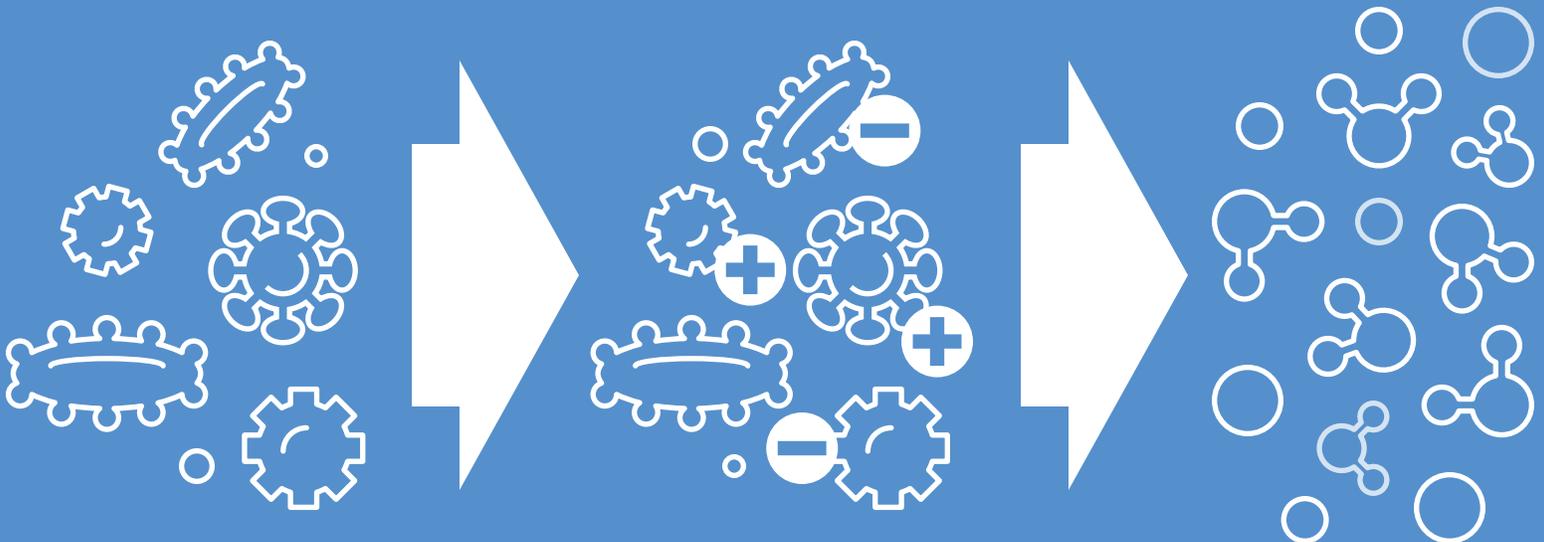
How the iWave Technology Works

iWave works to safely clean the air inside industrial, commercial and residential buildings. The patented technology uses positive and negative ions to address harmful IAQ issues such as pathogens, VOCs, odors, and particulate. The ions produced travel within the air stream into the occupied spaces, cleaning the air everywhere the ions travel, even in spaces unseen.

**Harmful Particles
(including pathogens)**

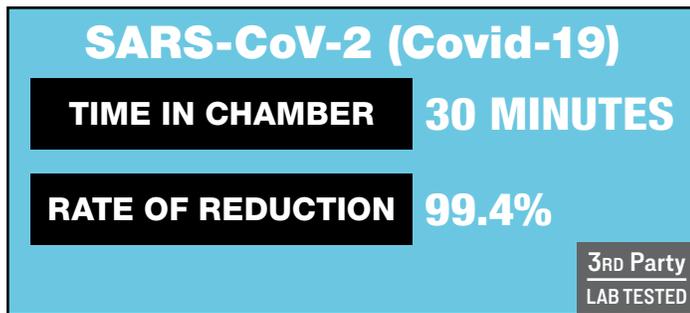
**Positive and Negative Ions
Defeat Pathogens**

**The ions address particulate, and
breakdown harmful VOCs into
harmless compounds.**



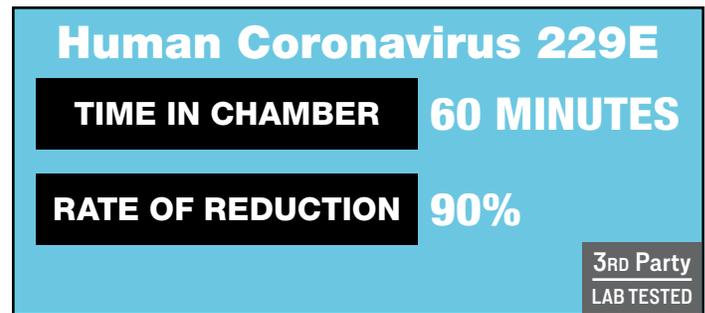
How iWave Addresses Pathogens

The ions produced by iWave's NPBI technology are attracted to harmful pathogens. When the ions combine on the surface of a pathogen, they rob the pathogen of the hydrogen necessary for them to survive. Substantial testing has been conducted to confirm the kill rates of various pathogens. Below is a chart that shows the results of testing that has been completed by various third party, independent testing firms.



This test was run using the iWave-C Air Purifier P/N 4900-10 in a test designed to mimic ionization conditions like that of a commercial aircraft's fuselage.

Based on viral titrations, it was determined that at 10 minutes, 84.2% of the virus was inactivated. At 15 minutes, 92.6% of the virus was inactivated, and at 30 minutes, 99.4% of the virus was inactivated.



This test was run in a test chamber in a lab setting with the Nu-Calgon iWave-R Air Purifier P/N 4900-20.

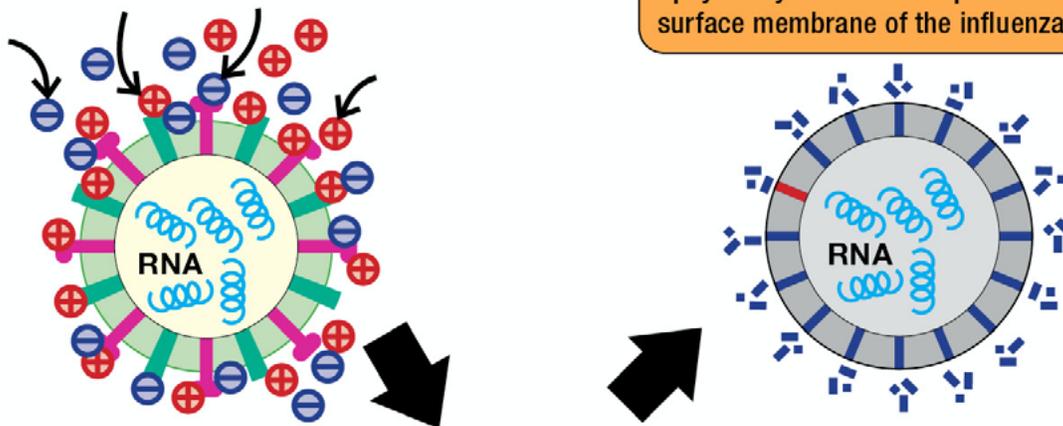
A petri dish containing a pathogen is placed underneath a laboratory hood, then monitored to assess the pathogen's reactivity to Needle Point Bi-polar Ionization (NPBI) over time. This controlled environment allows for comparison across different types of pathogens.

Rapid, Continuous Air Cleaning

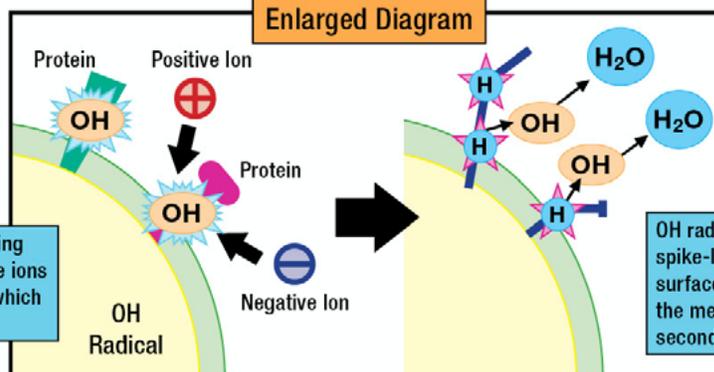
iWave's NPBI technology releases a high concentration of positive and negative ions that immediately begin attaching to particulates, which includes pathogens and other harmful compounds. As these ions enter the air stream, they offer continuous treatment throughout the entire facility or home.

Positive and negative ions surround the surface membrane of the airborne virus.

A chemical reaction takes place that physically breaks down proteins in the surface membrane of the influenza virus.



Enlarged Diagram



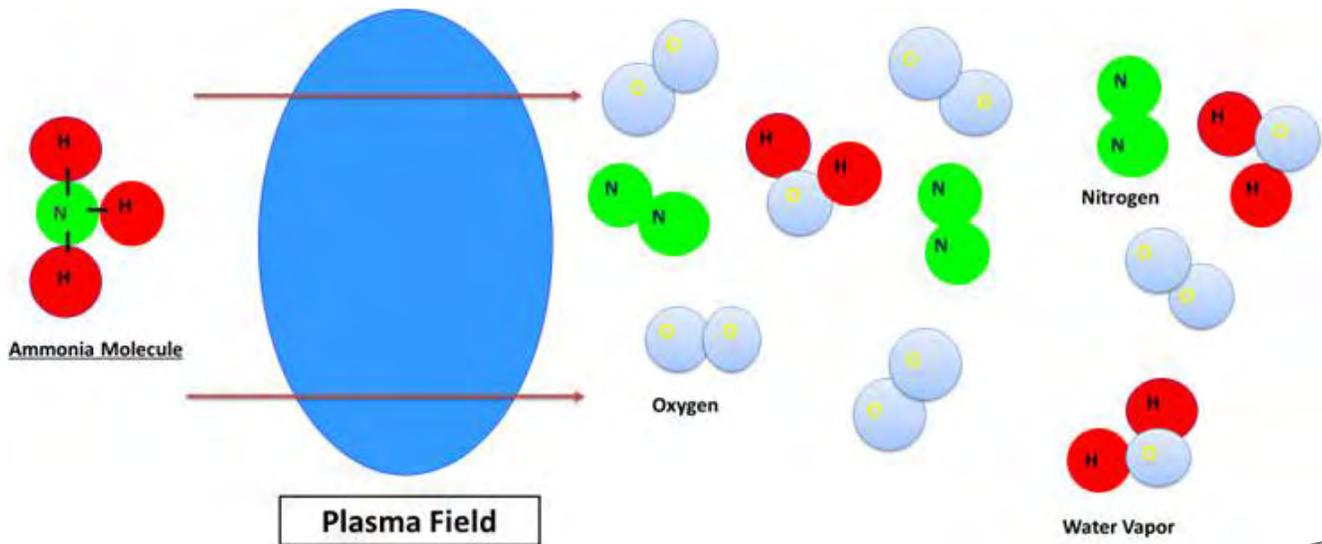
Through a chemical reaction occurring on the virus membrane surface, the ions are transformed into OH radicals, which are powerfully active but unstable.

OH radicals steal hydrogen atoms from the spike-like proteins that protrude from the surface of the virus membrane, opening holes in the membrane. When the OH radicals acquire a second hydrogen atom, they form water (H₂O).

(Information taken from collaborative research done in association with Professor Gerhard Artmann of Aachen University of Applied Sciences in Germany.)

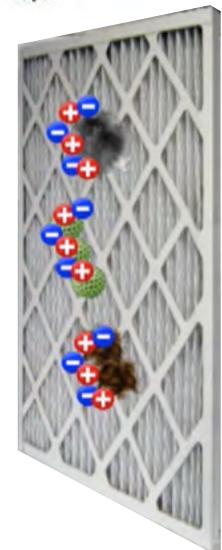
How iWave Treats VOCs and Odors

The ions produced by iWaves needle point bi-polar ionization (NPBI) break down volatile organic compounds (VOCs). The VOCs can be unpleasant odors or harmful chemical compounds. The harmful gases and odors are broken down to harmless compounds already prevalent in the atmosphere such as oxygen, nitrogen, and water vapor. For example, ammonia which is typically described as body odor, is broken down to nitrogen and water vapor as seen in the diagram below.



How iWave Addresses Particulate

The ions emitted by the iWave causes fine particulate to accumulate and clump together, this is called agglomeration. This fine particulate is now formed into larger, filterable particles that even lower-efficiency filters can easily capture from the air. Third party lab testing of iWave's NPBI shows that a system using an iWave-R with a MERV 8 filter can achieve similar results as a system using a MERV 13 filter without an iWave.



Ionization Helps Improve Filter Efficiency

MERV RATING	FILTER ONLY	FILTER + UVC***	FILTER + IONIZATION* **
6	6.2%	10%	34%
7	7%	12%	61%
8	11%	19%	84%
10	12%	35%	89%
13	46%	84%	97%
15	71%	97%	99%
16	76%	98.80%	99.90%
17 (HEPA)	99.90%	99.99%	99.999%

*Ionization increases the filter efficiency 4-5 MERV levels. **Does not take into account ionization kills in the space and on surfaces.

***UVC does not effectively kill airborne pathogens in high RH conditions¹

¹ASHRAE technical paper on airborne infectious diseases

There's an iWave solution for any type of facility!



Hospitals and Healthcare	Gym and Athletic Facilities	Manufacturing Facilities
Higher Education	Assisted Living Facilities	Hotels and Resorts
Military and Government	Correctional Facilities	Residential
Restaurants	Recreational Facilities	Places of Worship

FREQUENTLY ASKED QUESTIONS

What is iWave's Needlepoint Bipolar Ionization technology?

NBPI is an artificial generation of both positive and negative ions through needle points, without the production of ozone or harmful byproducts.

How does iWave's NPBI kill pathogens?

iWave technology produces ions that kill pathogens by robbing them of life-sustaining hydrogen. The ions also breakdown harmful VOCs into harmless compounds like O₂, CO₂, N₂, and H₂O.

Does iWave produce harmful byproducts?

No. Passing through an ionization field causes harmful compounds to break into harmless compounds already present in the air.

Is NPBI safe for people and animals?

NPBI products are completely safe for humans and animals. This technology only produces elements and compounds that are naturally found in air.

Do air filters need to be changed more frequently when used with iWave?

Filter change intervals may be increased in some applications based on run time and how the space is utilized. Most applications can maintain their existing filter change schedule.

Does ionization degrade filters, insulation, wire coatings, and plastic like UV lights?

No. Ionization leaves other equipment unaffected.

How long does the product last?

On average the product lasts the life of a new system, or 10-15 years.



iWave-C

No maintenance air purifier for commercial and residential systems



iWave-R

Self-cleaning, maintenance-free air purifier for residential systems



iWave-M

Mini flexible air purifier for mini-splits and other systems



iWave-V

Low maintenance air purifier for residential systems