

PATHOGEN TEST RESULTS

All tests were run using proprietary NPBI™ technology.

SARS-CoV-2 (Covid-19)

TIME IN
CHAMBER

30 MINUTES

RATE OF
REDUCTION

99.4%

3RD Party
LAB TESTED

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.

Human Coronavirus 229E

TIME IN
CHAMBER

60 MINUTES

RATE OF
REDUCTION

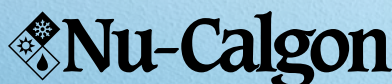
90%

3RD Party
LAB TESTED

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.

iWave's Needle Point Bi-polar Ionization (NPBI) technology is used in a wide range of applications across diverse environmental conditions. Since locations will vary, clients should evaluate their individual application and environmental conditions when making an assessment regarding the technology's potential benefits.



Air Purification Through Bi-Polar Ionization

Nu-Calgon has partnered with Global Plasma Solutions (GPS) to bring a new, advanced air purification technology to the HVACR market. This patented technology called needle-point bi-polar ionization uses carbon fiber brushes to produce a refined electrical charge to proactively and safely clean the air in residential and commercial buildings. The iWave approach produces equal amounts of positive and negative ions (combined charge neutral) that react and break down pathogens, allergens, particles, smoke, odors and VOCs in the air, creating a healthy environment without producing any harmful byproducts like ozone or unstable ROS (Reactive Oxidation Species) molecules that result in the use of PCO technologies.



How Bi-Polar Ionization Works

iWave devices are bi-polar, meaning they use two emitters to create equal amounts of positive and negative ions. When these ions are injected into the air stream, creating a plasma region, they break down passing pollutants and gases into harmless compounds like oxygen, carbon dioxide, nitrogen and water vapor. When the ions come in contact with viruses, bacteria or mold, they remove the hydrogen molecules from the pathogens. Without hydrogen, the pathogens have no source of energy and will die. The ions also attach to allergens, such as pollen, smoke and other particles, causing them to band together until they are large enough to be caught by filters.



iWave's technology generates the same ions that nature creates with lightning, waterfalls, ocean waves, etc. Nature uses ion energy to break apart molecules, naturally cleaning the air and producing a healthy environment. The only difference between iWave's technology and nature is that iWave does it without developing detectable ozone. In fact, third party testing of iWave technology by Intertek/ETL to the UL867 ozone chamber test confirmed ozone levels less than 0.00PPM!

How iWave Ionization Differs from PCO Technology

Unlike iWave's bi-polar ionization method, Photo Catalytic Oxidation (PCO) technology uses UV light, commonly with titanium dioxide (TiO₂) and often with other alloys, to create ionization. The Centers for Disease Control (CDC) has warned of cancerous risks involved with TiO₂* – not something you want in a building's air quality!

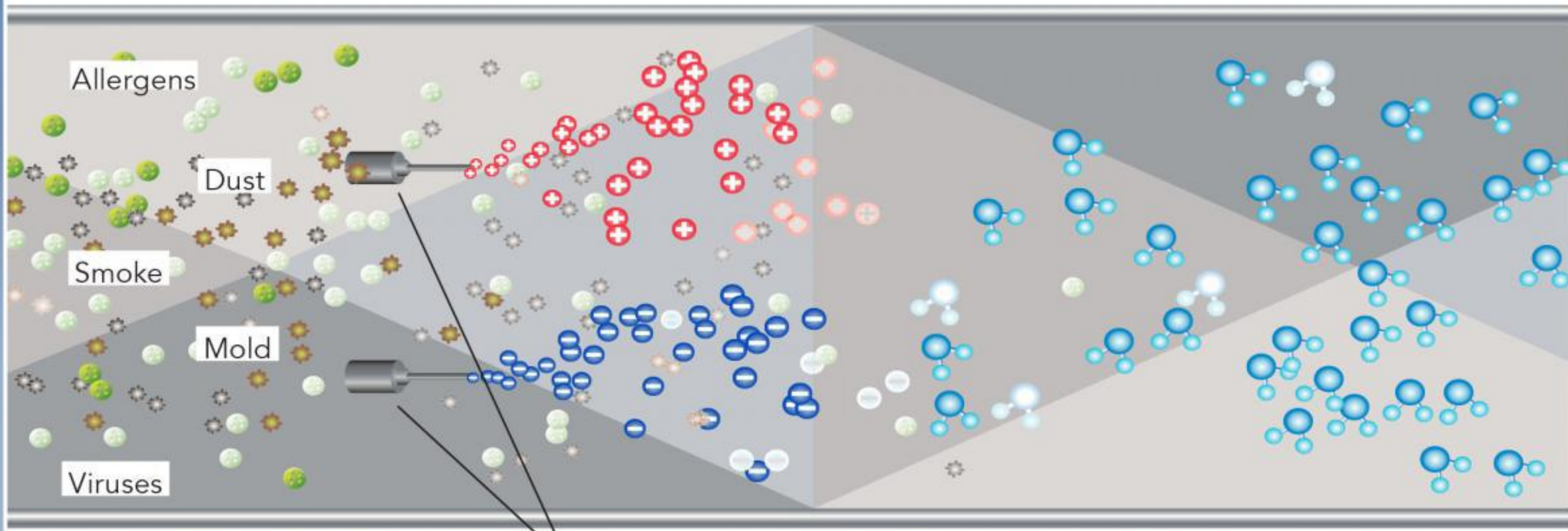
ASHRAE issued a position document in January 2015 on Filtration and Air Cleaning where they cautioned UV lamps used in many PCO devices can emit significant ozone – known to be harmful for human health. They also observed and reported on page 9 of the document "...potential of an incomplete oxidizing process, which produces by-products of reaction that can be more toxic or harmful than the original constituents (i.e. formaldehyde). The catalysts can be contaminated (poisoned) by airborne reagents and/or products of oxidation, which results in reduced or total efficiency failure of the process." Lastly, the PCO approach requires the replacement of the UV cell every year or two. Bi-polar ionization requires no replacement parts, and on the self-cleaning models, they are maintenance free. The chart on the next page shows several advantages of iWave technology over two common market approaches.

*CDC Current Intelligence Bulletin 63



Polluted Air

Clean Air



iWave Ion Generator

iWave AIR PURIFIERS

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INNOVATIVE
BIoANALYSIS

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Human Coronavirus 229E

TIME IN
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RATE OF
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ALG
ANALYTICAL
LAB GROUP

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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.

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 Nu-Calgon