PlasmaAir
A WellAir Brand

Efficacy, Safety and History of Bipolar Ionization and Plasma Air

About Plasma Air

Plasma Air was established in 2007 with the pursuit and commitment of providing clean and safe indoor air. This fundamental commitment has guided the company while we partnered with distributors and engineers to deploy our bipolar ionization solutions worldwide. Today our solutions protect over 400 million square feet of indoor environments, from schools and universities to arenas, airports, offices and hotels.

400 million square feet

We take a transparent, science-based approach to product development and strive to create products that keep our indoor world safer for the people who inhabit it. Our Plasma Air needlepoint bipolar ionization solutions have **UL 2998 certification** for **zero ozone production** and **UL 867 safety certification** for electrostatic air cleaners. These standards and certifications are an important way for schools and other building owners to have confidence in the quality of the products they choose.

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Ionization – A Historical Perspective

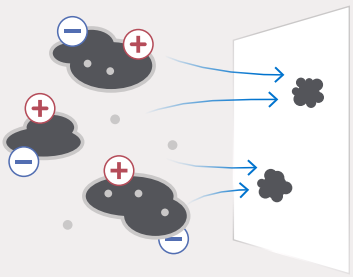
Bipolar ionization first arrived in the US in the 1970s as a tool to control pathogens in food manufacturing. However, ionization has been around since the beginning of time. Ionization of air occurs naturally in our world and is strongest around crashing ocean waves, waterfalls, mountains, and electrical storms (the freshest air available). Scientists, engineers and manufacturers worldwide have been able to harness this power using bipolar ionization-based products for indoor air quality needs. Over the past 50 years, there have been hundreds of test reports, case studies, and clinical trials showing the safety and efficacy of bipolar ionization.

Bipolar Ionization – How it Works

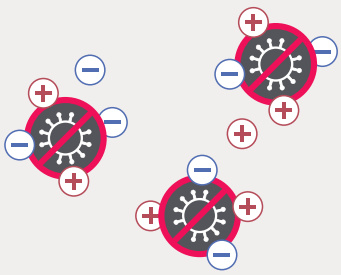
Like the naturally occurring process described above, Plasma Air's needlepoint bipolar ionization technology produces a natural climate rich in positive and negative oxygen ions. The negative ions contain an extra electron while the positive ions are missing an electron resulting in an unstable condition. To restabilize, these bipolar ions seek out atoms and molecules in the air to trade electrons with, effectively neutralizing particulate matter, bacteria and virus cells, odorous gases and aerosols, and VOCs.

Needlepoint bipolar ionization utilizes electrodes, or "needles" made from gold, carbon fiber, titanium, stainless steel, silver, or any other corrosive resistant, conductive material.

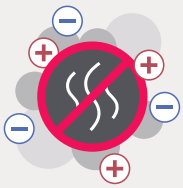
Note: *Plasma Air's needlepoint bipolar ionization solutions are classified as ozone free and certified to meet UL 2998 standards. This makes it ideal for a wide variety of applications.*



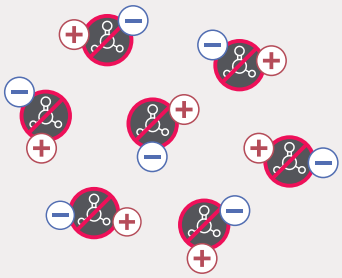
Airborne particles are charged by the ions causing them to cluster and be caught in filters



Bacteria and viruses bond with oxygen ions and are destroyed



Many odorous gases and aerosols oxidize with oxygen ions and are neutralized



Oxygen ions cause a reaction with VOCs breaking down their molecular structure

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Bipolar Ionization – Efficacy

Over the years, bipolar ionization has come under scrutiny due to some misconceptions over the lack of independent research showing the safety and effectiveness of ionization in real-world settings. However, there exists an extensive list of peer-reviewed articles. In particular, the Jiang Paper reviewed 263 peer-reviewed articles on the subject. Jiang's conclusion after a meta-analysis of known literature and studies on air Ionization was that there was no evidence of ionization harming humans.

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The Journal of Negative Results in Biomedicine published a study titled, A Comprehensive Review of Air and Respiratory Function Outcomes, in which over 60 years of peer-reviewed articles were researched. Researchers determined that "...collectively, the literature does not provide any reliable evidence for effects of negative or positive air ions on pulmonary, respiratory or metabolic measures." Moreover, independent lab tests and real-world installations consistently show that needlepoint bipolar ionization technology – does not increase ozone, carbon dioxide, VOCs, nitrogen dioxide, or fine particles. This technology significantly reduces the amount of harmful pollutants in the air to levels much lower than found in most outside air.

99% Deactivation of MS2 Bacteriophage
(SARS-CoV-2 surrogate virus)

Bipolar ionization will continue to be an effective and safe technology in our industry, and we support the continued testing and publishing of data. Plasma Air's needlepoint bipolar ionization technology has been tested for safety by international organizations such as Underwriters Laboratories and Intertek and meets applicable engineering standards specified by ASHRAE. Most recently, Plasma Air's 600 Series, 660 Series, 7000 Series, BAR and AutoClean products were UL 2998 validated for zero ozone emissions.

In a test designed by two third parties — Aerosol Research and Engineering Labs (an FDA accredited lab) and the Spanish Ministry of Defense — the 600 Series was shown to reduce aerosolized MS2 Bacteriophage (SARS-CoV-2 surrogate) by 99%.

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CDC Position on Bipolar Ionization

If you are considering the acquisition of bipolar ionization equipment, you will want to be sure that the equipment meets UL 2998 standard certification (Environmental Claim Validation Procedure (ECVP) for Zero Ozone Emissions from Air Cleaners) which is intended to validate that no harmful levels of ozone are produced.

For additional information on our technology and solutions please contact us at info@plasma-air.com.