

White Paper

White Paper on Unique Effectiveness of MCI Multi-Cluster Ionization™ in Managing IAQ

Introduction

Historically, the air purification industry has been challenged with addressing the multi-faceted problem of IAQ contaminants. Manufacturers of equipment are typically the same ones who have invented specific components and, therefore, design and build their products around their own components, usually a single component, like PCO, DBI, Corona Discharge and such like. This has resulted in the consumer requiring multiple units, and that of different kinds of technology, to address, in a holistic way, the IAQ problem. MCI (Multi-Cluster Ionization)™ is the concept of utilizing multiple components, together in a single product, to form a more powerful synergistic multi-strategic approach to most, and in some cases all, IAQ contaminants in the air and on surfaces. By combining a variety of sub-manufacturers, under the direction of a single assembler, MCI air purification technology is a natural, safe process of addressing IAQ in a holistic way.

Background

Indoor air quality problems include microbes (bacteria and fungus), particulates (pollen, second-hand smoke, etc.), volatile organic compounds (cleaning products, personal care products, petro-chemicals, etc.) and odors (pets, chemicals, cooking, etc.). Until now, addressing these in a holistic way has been difficult.

In the early 1990s NASA developed a basic new technology that addresses the IAQ issues. It has been called many things in the marketplace since that time but basically identified as “photo catalytic ionization” technology. This component, a germicidal wave length close to a target plate, turned the power of ultra-violet light from a passive technology to active technology, producing a series of “oxidizers” that could, when introduced into occupied space, control certain IAQ contaminants. Peer-reviewed university publications, clinical analysis and field studies have proven the effectiveness of such components on surrogate microbes such as Stachybotrys, MRSA, MS2 Virus and other contaminants. (see Grinshpun, UC 2007) (Photocatalytic Removal, 2001)

In the early 2000s, a Korean company perfected the ionization technology by developing a component that produces a bi-polar ion similar in structure to the “kill mechanism” of the PCO technology. This component, called dielectric barrier ionizer, received an international patent for its unique design which resulted in a small component that was especially effective on VOCs (volatile organic compounds) and particulates. Multiple studies have been done, both clinically and in the field, to show the effectiveness of this low voltage component. (see SGS, Hong Kong 2008 and Oasis Lab, 2014)

Solution

The cluster ion approach to air and surface sanitization is now seen to be a mechanical kill mechanism rather than a chemical kill thus making it impossible for microbes to reproduce or develop immunities to the technology. Unlike chemicals to which microbes can build a tolerance, clustered ion technology

destroys to structure of the microbe in a mechanical way. Particulates are clustered and taken to the filtration system while odors and VOCs are oxidized in the process.

Because each indoor environment is unique (variety of contaminants, lifestyle differences, airflow, furnishings, etc.) each major market must be analyzed and addressed individually. Products designed for the poultry industry would require a different combination of components than the medical industry which would differ significantly from the casino market. The assembler/manufacturer of MCI purification technology has combined the power of two or more components in each product to produce a multi-strategic approach to IAQ contaminants in the air and on surfaces for specific markets, thus creating a unique approach to that market. Products using this synergistic approach are designed to address specific environments.

Where possible, design patents can be secured to protect the design of the air purification equipment. By using multiple sub-manufacturers, who are incapable of reproducing the competitor's components, the assembler/manufacturer is more likely able to protect the product line from design challenges. Methods are in place to reduce the possibility of reverse engineering.

Conclusion

MCI (Multi-Cluster Ionization)[™] is an economical solution to resolving a variety of IAQ contaminants in a unique way. Energy efficient low voltage components combined in a synergistic way to address particulates, odors, microbes and VOCs in the air and on surfaces will become the new "hand-washing" for sanitizing air and surfaces where traditional sanitization processes are proving less effective.

Inclusions:

- MCI (Multi-Cluster Ionization)[™] Certificate (available upon request)
- MCI SynAIRgPure Specification Sheet
- University of Cincinnati (EcoQuest report—out of business)
- Photocatalytic Removal of Hazardous Compounds, 2001
- SGS Report, 2008
- Test for cigarette VOC in Crown hotel room (Oasis Lab), 2014