



OVERVIEW OF AIRIUS PHI

The Airius Photohydroionization (PHI) is a combination of two new proprietary technologies.

Airius Thermal Equalizer – Air movement technology
Photohydroionization Cell (PHI) – Air purification technology - Advanced Oxidation Technology

This document provides an overview of the new combined technologies product line, the Airius PHI. Let's first discuss the Airius Thermal Equalizer.

Description of Airius Thermal Equalization

The Airius Thermal Equalizer is a new product line that significantly reduces energy consumption in educational, institutional, government, commercial and industrial facilities. They are particularly effective in facilities with high ceilings. This product is superior to any product currently on the market in terms of the quiet destratification of air, resultant energy savings and improved temperature environment.

The Airius Thermal Equalizer products reduce the effects of warm air rising to the ceiling by directing the hotter air at the ceiling to the floor, where the warm air is needed, in a concentrated column of air. These products provide thermal equalization between the floor temperature and the temperature at the ceiling. This approach allows the floor to be used as a thermal storage sink further enhancing the energy savings. The net result is reduced energy consumption while improving the comfort of staff and visitors in the buildings by eliminating "hot spots" and "cold spots."

Description of Photohydroionization (PHI) Cell and Technology

The goal of air purification is to improve our health through the removal of contaminants from the air we breathe. Government agencies, particularly the EPA, now consider indoor air pollution a major environmental health problem. Mold, once considered an unpleasant product of nature, is now believed to be the cause of many respiratory diseases. Most colds and viruses are caught indoors by airborne germs.

Airius
811 S. Sherman Street, Longmont, CO 80501
Office: 303-772-2633 Fax: 303-772-8276
www.airiusthermalequalizer.com
e-mail: airius@avedon.com

1

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Indoor air pollution, poor ventilation, chemical and biological contamination left unchecked, will lead to sick buildings. With today's Airius PHI technology, indoor air pollution is no longer a necessary evil of today's tightly built, energy saving buildings. The US Environmental Protection Agency and Consumer Product Safety Commission completed a report on Indoor Air And Your Health dated April 1995.¹ Some of the highlights:

- Health effects from indoor air pollutants may be experienced soon after exposure or, possibly, years later.
- Immediate effects may show up after a single exposure or repeated exposures.
- These include irritation of the eyes, nose, and throat, headaches, dizziness, and fatigue.
- Symptoms of some diseases, including asthma, hypersensitivity pneumonitis, and humidifier fever, may also show up soon after exposure to some indoor air pollutants.
- The likelihood of immediate reactions to indoor air pollutants depends on several factors. Age and preexisting medical conditions are two important influences.
- Some people can become sensitized to biological pollutants after repeated exposures, and it appears that some people can become sensitized to chemical pollutants as well.
- Certain immediate effects are similar to those from colds or other viral diseases, so it is often difficult to determine if the symptoms are a result of exposure to indoor air pollution.
- Other health effects may show up either years after exposure has occurred or only after long or repeated periods of exposure. These effects, which include some respiratory diseases, heart disease, and cancer, can be severely debilitating or fatal. It is prudent to try to improve the indoor air quality in your workplace even if symptoms are not noticeable.
- While pollutants commonly found in indoor air are responsible for many harmful effects, there is considerable uncertainty about what concentrations or periods of exposure are necessary to produce specific health problems.
- People also react very differently to exposure to indoor air pollutants.

The PHI Cell is designed to reduce sick building syndrome risks by reducing most biological and chemical contaminants and dramatically improving air circulation. PHI is an Advanced Oxidation Technology. It utilizes a broad spectrum high intensity UV light targeted on a quad metallic catalyst ultraviolet (UV) target in a low-ozone and moist atmosphere. This creates a unique oxidation process providing friendly oxidizers, that can target specific chemical and biological contaminants, or very safe and aggressive oxidizers that revert back to oxygen and hydrogen after the oxidation, i.e. death of the biological pollutant or inert bonding of the chemical pollutant. In short, the process kills the bugs and neutralizes nasty airborne chemicals while improving air circulation and providing energy savings in the winter.

¹ EPA Document # 402-K-93-007, April 1995

Reasons To Use The Airius PHI Technology

Germicidal UV light rays have been used for decades by the medical industry as a method for destroying microorganisms (germs, viruses, bacteria). However, germicidal UV light is effective in reducing only the airborne micro-organisms that pass directly through the light rays. The Airius PHI continually circulates the air through the Airius PHI unit, passing the air directly through the UV light to destroy the biological micro-organisms.

Germicidal UV light has little to no effect on gases, vapors or odors. PHI, on the other hand, is very effective on gases, vapors, VOCs (volatile organic compounds) and odors.

The combination of safe low level ozone (O₃) and UV light enhanced by a hydrated quad-metallic compound target develops an advanced oxidation reaction that creates as well as reduces ozone to safe low levels. This process also produces hydro-peroxide, super oxide ions, ozonide ions and hydroxides that have the ability to bond and neutralize chemicals such as mercury, benzene, formaldehyde, chloroform, and ammonia. By engineering the proper UV light wavelength, in combination with a triple function, minimal maintenance Airius PHI unit, the Airius PHI provides safe hydro-peroxides, super oxide ions, ozonide ions and hydroxides to purify the air that is being continuously circulated through the Airius PHI unit.

With the Airius PHI, micro-organisms can be reduced by over 95%. Gases, VOCs and odors can also be reduced significantly, and the room will have ozonide ions, hydro-peroxides, super oxide ions and hydroxides that will give facilities fresh, clean and odor free air.

In addition, while the air is continuously being purified, the space is also being thermally equalized. This results in improved comfort through the elimination of “hot spots” and “cold spots” and the potential for a significant reduction in energy consumption by balancing the floor and ceiling temperature.

Where Should I Use the Airius PHI Technology?

The types of facilities for the Airius PHI applications include those listed below.

- Public event facilities
- Waste disposal and refuse collection facilities
- Educational facilities
- Recreational facilities
- Educational institutions
- Selected industrial and commercial facilities
- Selected retail – restaurants and bars
- Government facilities
- Law enforcement facilities
- Hospitals

The applications within the above include, but are not limited to those listed below.

- Sanitation facilities
- Locker rooms
- Swimming pools
- Medical and first aid rooms
- Food preparation
- Food processing
- Law enforcement holding rooms
- Disposal and refuse areas
- Contaminated space or rooms
- Jails

For further information, contact Airius.

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