

Winner!
Three product of the year awards.

Protect your Bus or Railcar and its occupants


- Reduce A/C Maintenance
- Improve Indoor Air Quality
- Restore Cooling Capacity

MOLDS: mold products, spores, toxins - "allergens"

BACTERIA: legionella, tuberculosis, staph and strep

VIRUSES: colds and flu - Chicken pox and measles

ODORS: mildew, decay and other volatile organic compounds



➤ Steril-Aire devices degrade organic buildup in coils, keeping coils continuously clean. A Steril-Aire UVC installation offers **the most rapid payback in the industry**. A typical installation can pay for itself in a few months and **save thousands of dollars** thereafter in energy and maintenance costs.

Comfort Control

Controlling space temperature and humidity have been associated with higher attendance, productivity, and revenue, so there are few non air-conditioned spaces today. However, its use has brought a gradual but sharp increase in operation, maintenance, health and legal costs. Using UVC has brought all of these back in line.

Biological Contaminants

Many pollutants are in the indoor air but bioaerosols are now known as the leading cause of Sick Building Syndrome and Building-Related Illness. Bioaerosols are airborne particles from living things - including microorganisms, their fragments and metabolic products or toxins.

Airborne and surface microbes include: pathogens (viruses, bacteria and fungi which cause measles, chicken pox, Legionnaires' disease, tuberculosis and other infectious diseases); allergens (bacteria, fungi and their products which cause allergic rhinitis, asthma, humidifier fever and hypersensitivity pneumonitis); and toxins (endotoxins, mycotoxins and VOC which cause a variety of toxic effects, irritation and odors).

Allergens

Among allergens, mold and mold products are most common worldwide. In HVAC systems and spaces, mold can proliferate year-round and its presence can initiate a chain of reactions starting with the release of histamines, and inflammation of most mucous membranes. They're followed by classical IAQ symptoms from watery eyes, congestion and breathing difficulties to allergy asthma and other complications.

According to the World Health Organization (WHO), the combined effect of bioaerosols in indoor air accounts for a substantial portion of the absences from school and work, as well as days where activity is impaired or restricted. They also report that the cost of these losses far exceed the cost of owning, operating and maintaining HVAC systems.

HVAC Systems

Today's A/C systems are perfect environments to grow and spread mold and bacteria and are great conduits for other microorganisms including colds and flu. These are referred to as "bioaerosols" and by recirculating large amounts of air, bioaerosols originating from and recirculating through A/C systems are transported floor to floor, room to room and person to person.

Since mold and bacteria grow downstream of the filtration system on the coil and in the drain pan and since airborne microbes can be as small as 0.02 micron, common A/C filters offer little protection. Government agencies, health care professionals and IAQ researchers agree that other possible control methods are impractical, potentially toxic, detrimental to equipment operation and efficiency, or simply too costly. As a result, experts are turning to HVAC style UVC technology to control the growth and spread of all bioaerosols.

The Role of UVC

All of the earth's inhabitants depend heavily on the restorative and regenerative properties of the sun's rays particularly the UV spectrum and especially the "C" band, or UV"C". UVC is the germicidal band that has been used for 65 years to kill microbes in hospitals, laboratories, water treatment, beverage production, food processing, pharmaceutical plants, and more. However, until recently it couldn't work in air conditioning systems.

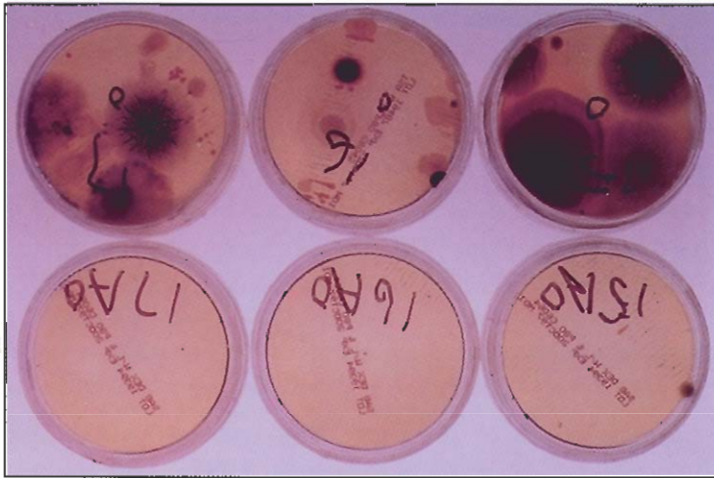
Through advancements in technology, UVC can now be used to destroy airborne infectious diseases such as colds and flu that circulate through A/C systems. It also now destroys the mold and bacteria growing on cooling coils and in drain pans and it vaporizes the organic materials they live on leaving coils and drain pans perfectly clean.

Coils and drains never need cleaning again and their associated odors, toxins and other allergens are eliminated too! With clean coils, energy efficiency, system capacity and maintenance expenses remain "as if new" for the life of the system!

Extraordinary Breakthrough

UVC is a 65-year-old proven technology that didn't work in cold or moving air and therefore not in air conditioning systems until now. Breakthroughs occurred when Steril-Aire overcame these problems with a line of patented laser lamp "UVC Emitters" designed specifically for HVAC equipment.

Independent tests prove these Emitters in A/C systems produce up to 7 times the output of conventional lamps. They provide rapid and continuous germicidal disinfection, coil cleaning and odor reduction, which explains the positive response researchers receive from Steril-Aire users.



These Petri dishes demonstrate the ability of all A/C coils, etc. to harbor, grow and circulate microorganisms. They also show the dramatic ability of a Steril-Aire UVC system to eliminate them. Shown in the top row are bacteria, mold and yeast. After exposure to a Steril-Aire UVC device (bottom row), they are eliminated.



After photo of one of 18 AHU's at the 500,000 sq. ft. Central and South West Services building - Dallas, TX.



These before (above) and after (below) UVC installation photos are of the Public Service Company of Oklahoma, an electric utility. The 300,000 sq. ft. building was plagued for 7 years with serious IAQ problems that are now abated thanks to UVC. Energy savings are even more dramatic.



Benefit Summary

A/C (1AQ) Improvement

- ❑ Eliminates allergy producing:
 - Mold and Bactria
 - Spore production
 - Metabolic toxins
 - Primary solvents and VOC's
 - Other non-specific odors

Reduces Maintenance Costs

- ❑ Degrades organic materials such that:
 - Coil and drain pans are continuously cleaned
 - Heat exchange capacity goes back to "as built"
 - Drain pans drain without tablets or chemicals
 - Coils and drain pans won't seed the ductwork or spaces with bioaerosols

Controls Infectious Diseases

- ❑ Classroom microbes are lowered by 90% reducing:
 - Allergies
 - Common Colds
 - Influenza
 - Measles
 - Chicken Pox
 - Whooping Cough

Affiliations

United Technologies Research Center,
East Hartford, Connecticut.

Rapid Precision Testing Laboratories,
Cordova, Tennessee.

Tulsa University,
Tulsa, Oklahoma.

Electrical Power Research Institute,
(EPRI) California! New York.

Public Service Company of Oklahoma,
Tulsa, Oklahoma.

Central and South West Services,
Dallas, Texas

Hawaiian Electric,
Honolulu, Hawaii.

Statements and Testimonials

US Department of Health & Human Services, Centers for Disease Control, 1993: "Research has demonstrated that ultra-violet germicidal irradiation is effective in killing "tubercle bacilli"; and that "UVGI (UVC) can be used as a method of air disinfection that supplements other engineering controls."

American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), Applications Volume, 1982 edition, Chapter 7: "UVC Sterilizing lamp installations in duct systems have been reported to be highly efficient."

Julie Hibbard, principal - Campe Verde Elementary School, Arizona - 1997: "UVC products (as manufactured by Steril-Aire) solved the 'Sick Building Syndrome' we were experiencing at our school. They eliminated all the terrible odors and extreme allergic symptoms that our teachers and students were experiencing."

Lloyd Stern, Facilities Superintendent, Iolani School, Honolulu, Hawaii - 1997: "We used to spend \$8,000 a year for coil cleanings. But in just a few days, the Steril-Aire UVC Emitters killed all of the mold growing on our coils and in our drain pans and cleaned them to 'as new.'"

Lisa Montagnino, Property Manager — DivcoWest Properties, San Jose, California 1998: "Higher than normal energy usage, excessive labor to maintain cooling efficiency and tenant employee absenteeism based on colds and flu symptoms were constant concerns. Since Steril-Aire UVC systems have been installed in our buildings the reductions are obvious."

David Lewis, Facilities Engineer — Central and South West Services, Dallas, Texas 1998: "Steril-Aire UVC systems were installed in our 500,000 sq. ft. building in early 1998. Even during the second hottest summer on record, we were able to shut down a 300 ton chiller, which paid for the entire install in three months. This is a "must have" product for anyone."

C. Borissenko, Director of Operations — Spectra Laboratories, Fremont, CA 1998: "As a medical reference laboratory serving the diagnostic needs of 45,000 kidney dialysis patients, airborne pathogens are a constant concern. Since the installation of the Steril-Aire UVC Emitters, airborne colony and number counts have been reduced to near zero levels! Additionally this product helped us meet joint Commission standards. Our current letter of commendation is proof that UVC in 1-IVAC works."



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