



HI-TECH FLU PROTECTION — USING — UV AT THE OFFICE



Hi-Tech Flu Protection:

Using UV At the Office

This time of year workplace absenteeism climbs as cold and flu viruses make the rounds. What can you do to protect your work force? How about safely sterilizing the air they breathe at work?

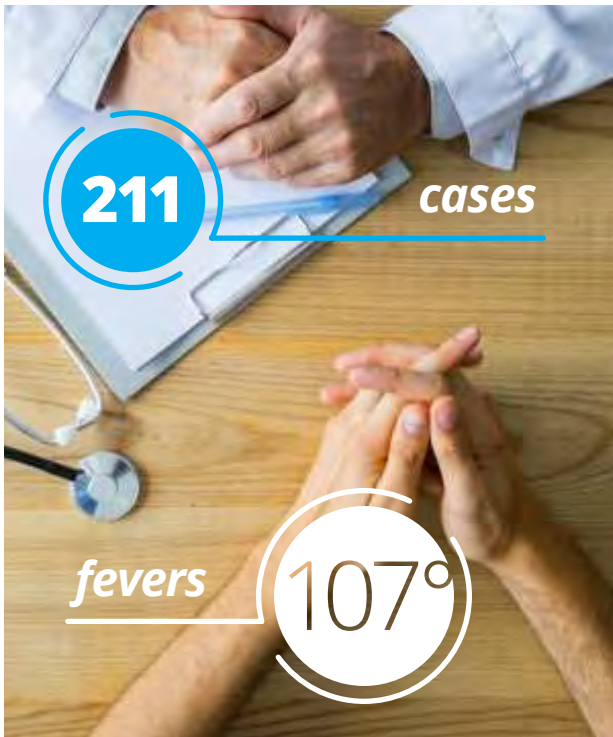
At the time, if you asked any of the 10,000 American veterans who were attending the American Legion state convention in July 1976, the weekend was a huge success. Rekindled friendships, renewed commitment to veterans' issues, and a whole lot of fun was most definitely experienced by all.

Until they started falling ill.

It started in late July. Pneumonia symptoms, accompanied by fevers as high as 107 degrees, began to strike. Men who had fought to survive on the battlefield and endured years of wartime conditions were suddenly victims of a mysterious new illness that came on quickly, resulting in hospitalization and even death for some.



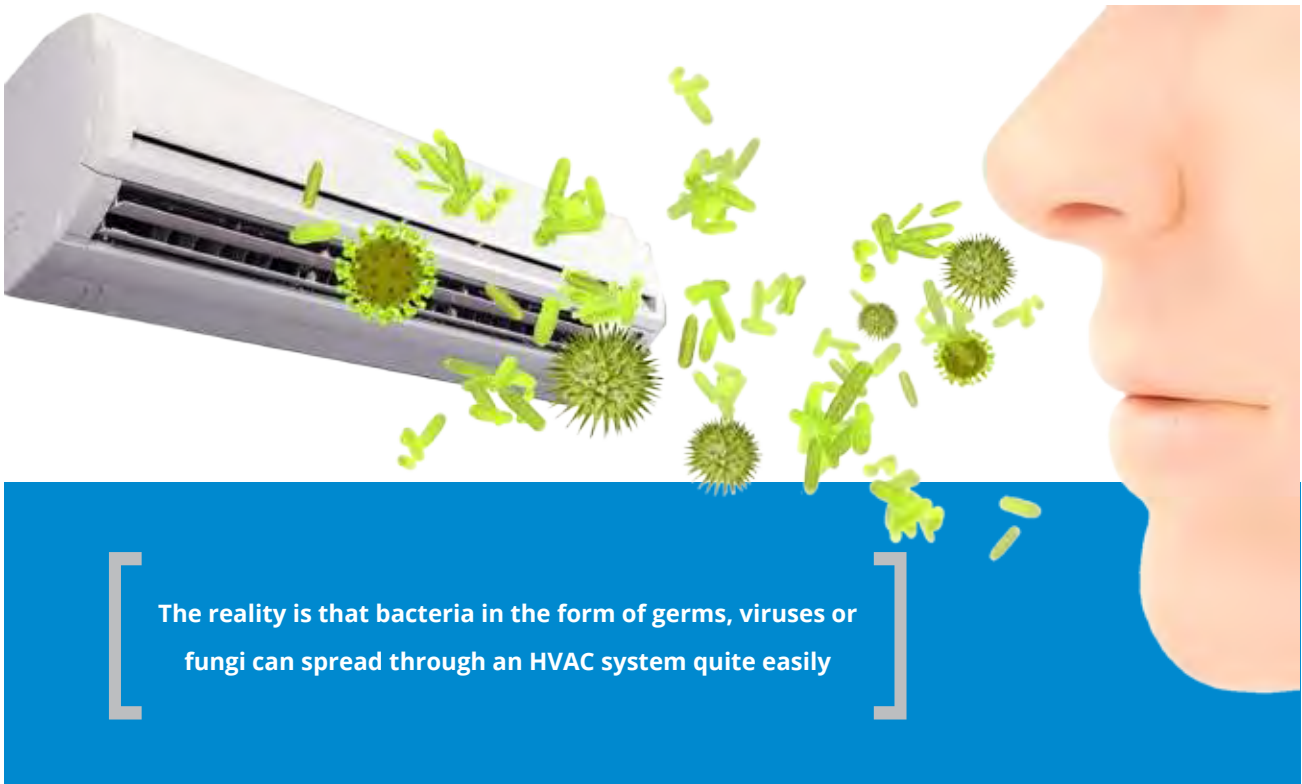
The Bellevue-Stratford Hotel, site of the first known outbreak of Legionnaires' disease. The hotel closed in November, 1976, four months after the outbreak. Photo by Jack E. Boucher



The news was reporting by early August that up to 14 men in Pennsylvania who had attended the convention had already passed away. President Gerald Ford consulted with his advisors about a mass vaccination program to protect America from this unknown but emerging scourge.

It took six months, 211 cases and 29 deaths for the Center for Disease Control and Prevention in Atlanta (then called the Communicable Disease Center) to identify the terrifying culprit: *legionella pneumophila*, a bacterium that can be treated effectively with antibiotics. It had spread through the HVAC system at Philadelphia's landmark hotel the Bellevue-Stratford, which temporarily closed its doors after the outbreak was identified.

It's a scary story, and thankfully an uncommon one. However, it underscores the reality that bacteria in the form of germs, viruses or fungi can spread through an HVAC system quite easily. Only with safety measures in place can indoor comfort truly be worry-free.



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Sick Building Syndrome

Sick Building Syndrome is another, perhaps more common, story reported in the breathless headlines of 2018. Studies have shown that workers, even in buildings that fully comply with current regulations and design standards, have reported one or more of the symptoms associated with this phenomenon. Furthermore, research has demonstrated that air-conditioned buildings are frequently involved in syndrome episodes.



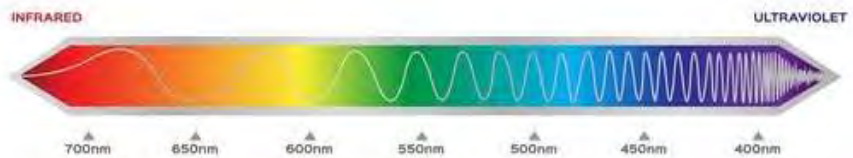
As commercial building or homeowners, what's the solution?

Indoor comfort has been shown to be critically important for worker productivity and even job satisfaction. In the sweltering heat of a Los Angeles summer, or in the morning chill of our local wintertime, it's simply not realistic to assume your employees or tenants will "tough it out" without the use of a reliable, effective HVAC system.

And for homeowners, who wouldn't want to make their residence a safe, clean haven from the risks of the outside world? An HVAC system that promotes health and well-being seems practically mission critical, for everyone.

The answer may lie in cutting edge UV light technology

Scientist Niels Finsen won a Nobel Prize in 1903 for his work treating tuberculosis with ultraviolet light. UV light is also utilized in the modern world within multiple industries for equipment sterilization and overall germicide. Today, the HVAC industry has made UV light an important option for any commercial or residential customer seeking to eliminate the threat of mold and bacteria from their current system.



First introduced in the mid-1990s, the technology surrounding UV has advanced considerably. Now ultraviolet equipment can prevent microbial buildup on all parts of your HVAC system, eliminating mold, bacteria and biofilm from growing and spreading throughout your home or commercial building.

Stopping Microorganisms in their Tracks



Ultraviolet devices for your HVAC system have multiple benefits, starting with your health. Consider the research. In 1996, scientists at the National Center for Biotechnology Information installed UV light technology within the HVAC equipment servicing only certain floors in a large office building. Among their findings:

- **UV light lowered fungal growth within air-handling units**
- **UV light lowered fungal growth within fiberglass insulation**
- **UV light lowered presence of airborne fungus within the floor space**

UV light has been shown to eliminate 90% of microorganisms

In addition, ultraviolet light has been proven to kill airborne cold and flu viruses, along with other nasty contaminants that can otherwise threaten the health of your tenants, employees, or family. In fact, UV light has been shown to eliminate 90% of microorganisms lurking in any home or commercial air conditioning system. This technology also reduces the presence of allergens and other irritants from your indoor air. Infants and the elderly are protected from germs and potential virus exposure. Hay fever and asthma sufferers, as well as those with underlying pulmonary problems or illnesses, will do better in an indoor environment where the air is clean, healthy and sanitized.

A similar study at Duke Medical Center also found that UV technology in HVAC lowered bacteria levels within hospital rooms by 97%. That's pretty significant!

Promoting Energy Efficiency

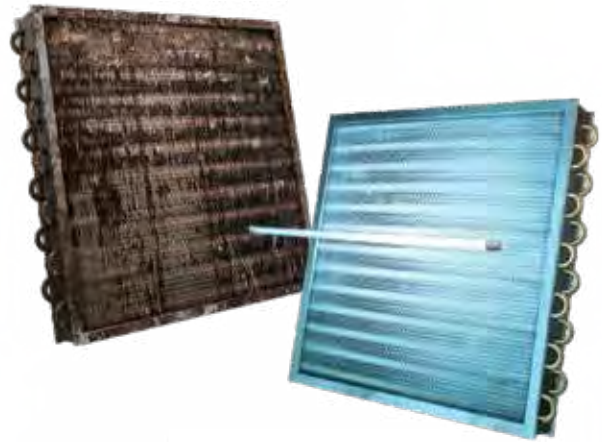
But keeping you safe from unwanted bacteria and contaminants isn't the only thing UV light systems can do. Used to clean your ductwork, cooling coils, and filtration equipment, ultraviolet light also improves airflow and overall system functioning. Without organic blockages or biocoatings left on your equipment from these undesirable contaminants, your HVAC can work more efficiently. Wear and tear on your unit is reduced, airflow is improved, and your system can function as it was designed. Energy consumption is reduced overall, as are your utility bills.



Two Types of UV Lights Available for Your HVAC System

There are two main options for HVAC when it comes to UV lights. Their price and complexity depend on where they will be used, and the size of the system they will be enhancing. Obviously, larger HVAC systems used for commercial buildings require more UV light, while private homes can often get by with less. Ask your licensed HVAC contractor for advice and further information.

The first kind of UV light used for sterilizing HVAC focuses around coil treatment. With this technology, UV light is placed in an area where it can treat the HVAC coils directly. Without UV light, microbes grow and adhere to the wet surface of the coil, using a sugary substrate they produce as their anchor. A nasty organic biofilm accumulates, ultimately choking the airflow within the coil. According to some sources if left untreated, it can restrict airflow upward of 40%! As you might imagine, aside from being disgusting, this in turn makes your HVAC system work harder to achieve a normal indoor temperature. Reduction in airflow stresses the equipment and shortens the lifespan of your entire system. It can also result in more costly utility bills. Bacteria are expensive!



Upon installation, UV light goes to work eliminating fungus, mold and other bacteria from the coils. Immediately, you'll notice improved HVAC functioning and better airflow as your system works unencumbered by slime. As one 2005 study, conducted by D. Witham and presented at an IUVA Congress stated,

"It's now amply proven that UV that eats away accumulated organic materials and biofilm growth in cooling coils to significantly improve airflow and heat-transfer efficiency levels, which not only reduce energy use, but also decrease system maintenance and their associated costs while providing cleaner, healthier air."



Clean Air

Air Sterilization: Killing Bacteria on Contact

The second kind of HVAC UV lights has been created around the idea of total air sterilization. These lights are placed directly inside the ductwork sending return air into the system. Killing bacteria upon contact, these HVAC UV lights also prevent build up from fungus, viruses and germs inside the air handler or furnace. That means any musty or moldy smells coming from your HVAC are also completely eliminated. Moreover, the UV lights can be calibrated to coordinate with blower motor functioning. When the blower motor is on, the UV lights turn on too, switching off only when the blower motor stops.

All UV light products will require expert installation and maintenance to function correctly. Your licensed HVAC technicians will concern themselves with the following issues as they add UV light technology to your home or business:

- **Size and lamp intensity**
- **Location and lamp direction**
- **Atmospheric humidity and overall temperatures inside the home or building**
- **Surface reflectivity in the area surrounding UV devices**

As environmentally responsible energy becomes more important, efficient HVAC systems that also keep your home or commercial building safe take on new urgency. A little bit of planning beforehand in considering these questions will allow for greater

success later with these devices. While there are products at multiple price points available, your existing HVAC equipment and overall space will determine the best equipment to use.

Your HVAC professional will help you to decide upon the right UV light system for your house or business. Whatever your choice, know that you are taking a real step toward keeping your workplace or home free from bacteria and contaminants, while maintaining indoor comfort for all.



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Robert Helbing, PE, is President of Air-Tro Heating and Air Conditioning Company. He is a Caltech-degreed aeronautical engineer (yes – a rocket scientist!), as well as a 4th generation contractor and 3rd generation engineer. He is a past-president of the Institute of Heating and Air Conditioning Industries (IHACI); Air Conditioning Contractors of America (ACCA) Contractor of the Year, 2011; and a 15-year member of Excellence Alliance Industries, a membership organization committed to the development and improvement of HVACR companies nationwide. Bob is also a founding member and past committee chair for the Western HVAC Performance Alliance, a council of stakeholders in the Energy industry which includes utilities, regulators, manufacturers and contractors. He currently serves on two committees for the WHPA: Commercial Quality Installation and the Existing Buildings Energy Efficiency. He can be reached at 626.357.3535 and bobhelbing@airtro.com.

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