

UVC FOR HVAC

An effective, cost-efficient way to eliminate mould and create cleaner air

BY MARA MULLER

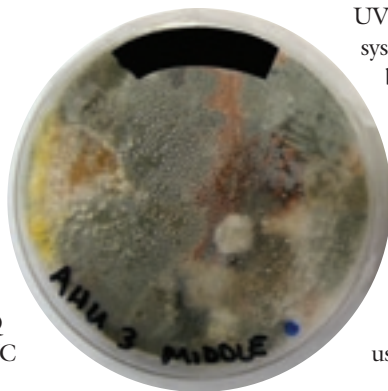
Over the past 20 years, events like British Columbia's leaky condo crisis, changes to emission regulations and advancements in understanding respiratory health and accompanying diseases have elevated the importance of good indoor air quality. As a result, most building owners and managers today recognize the value of making proactive IAQ choices — they keep building values high and tenants happy even if it means building managers incur extra costs. However, not all IAQ solutions have to come with a high price tag. UVC (ultraviolet C) technology can provide buildings with better IAQ and a financial return in energy and maintenance savings.

Sometimes referred to as UVGI or ultraviolet germicidal irradiation, UVC has been around for many years. But like any unfamiliar technology, it has taken UVC time to break into the HVAC market. This is possibly due, in part, to a lack of understanding about how it works. As a result, UVC is still at the cutting-edge, showing up primarily in LEED-rated and 'green' conscious facilities.

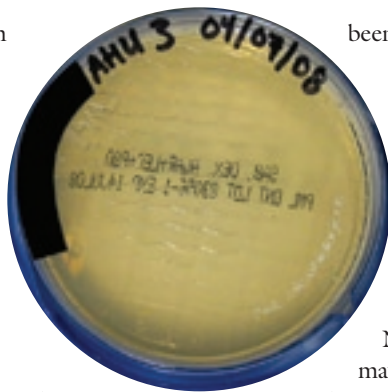
UVC is a wavelength of ultraviolet light that has germicidal properties. This wavelength is normally filtered out by the ozone layer but can be a useful tool when recreated and used in an HVAC environment. The light disrupts the DNA of microorganisms, destroying or rendering them unable to reproduce. Either way, the effect is the same — microorganisms, including mould, bacteria and other contaminants, are destroyed instead of re-circulating through a building's air. With UVC, occupants enjoy a more comfortable, cleaner indoor environment and the spread of airborne illnesses is reduced. This results in fewer sick days, higher productivity and the potential for increased revenues for companies.

For building owners and managers, UVC offers financial benefits as well. In the cold, damp environment of an HVAC system, mould, bacteria and other contaminants easily accumulate and grow on HVAC coils, forming a sticky biofilm. As biofilm accumulates on the coils, it restricts airflow, causing the fan to work harder to achieve the same air exchange while, at the same time, reducing net cooling capacity, which raises energy costs.

Coil biofilm is insidious — even the most meticulous maintenance program may not be able to remove it all from within the coil; those that do often employ caustic chemicals that can have corrosive effects on coils and a negative impact on the environment. In contrast, UVC emitters installed near the coil are capable of breaking down biofilm. They work continuously to clean the coil and prevent biofilm from re-growing, posing no risk to occupants or the environment.



Before (top) and after (bottom) UVC lights were in place. Sample taken from a large public facility in Vancouver.



UVC's constant cleaning power increases an HVAC system's overall efficiency. While savings vary from building to building (depending on the size of the install and local energy rates), managers of those retrofitted with UVC can expect to see a drop in their energy bill. They will also reap returns from decreased maintenance and the extended life of their HVAC equipment.

So why hasn't this technology caught on?

While UVC has long been used in food processing, water treatment and hospitals, its use in HVAC systems has taken time to perfect. In early models of UVC for HVAC, the low temperatures and moist environment in the air handler sometimes had a negative effect on bulb output. This is no longer the case — UVC has been tailored to the HVAC environment.

The other reason UVC for HVAC may be taking time to break into the market is installing this unfamiliar technology poses a certain amount of risk.

How do building owners, managers and engineers choose the right company? How do they evaluate claims? And how do they ensure they're not just investing in "snake oil?"

To a certain extent, this worry is founded.

Not all UVC is created equal and some companies may try to cash in on people's lack of knowledge.

As a result, anyone considering UVC should make sure companies are willing to back their performance claims.

It's also important to do research. There are third party UVC tests available to the public. The U.S. Environmental Protection Agency along with the Department of Homeland Security has tested UVC in HVAC as a possible protection against biological warfare attacks and consider it an option for reducing risk. This and another study conducted by researchers at McGill University in Montreal have shown UVC bacterial kill rates of up to 99 per cent. The Montreal study indicated (based on their results), if UVC was installed in all North American office buildings, it could resolve work-related or "sick building" symptoms for approximately four million people — a significant number.

Health is something most people invest in without expecting a tangible or quantifiable return. UVC for HVAC is a rare kind of health investment, one that can offer improved IAQ, a better quality of life and monetary savings. ♦

Mara Muller is the communications coordinator for Radec Air & Water Solutions Inc., the Western Canadian Distributor of Steril-Aire UVC. Radec provides customers with information and products for improved IAQ and offers energy efficient building solutions that will save money, increase comfort and reduce impact on the environment. Contact Mara at info@radecgroup.com.