Concepts and Designs
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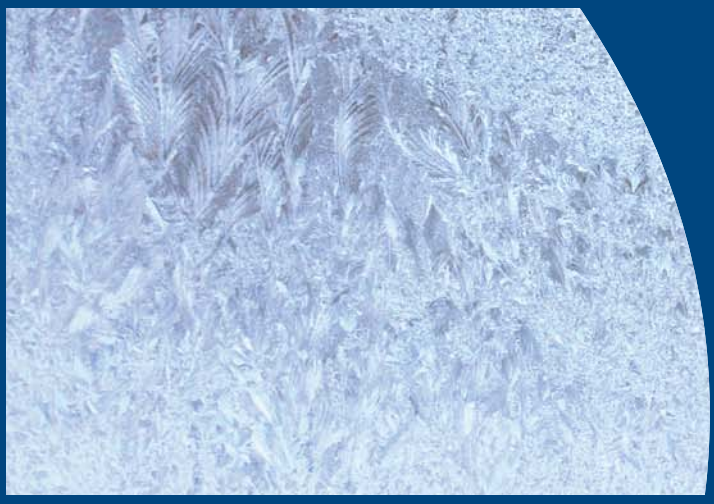
Washable UVGI Systems



Ultraviolet Germicidal Irradiation Systems for Washdown Air Handling Applications

Solutions for Indoor Air Quality

Why Use UVGI in Air Handling Systems?

Air handling systems contribute to the distribution of microbiological contaminants in two ways:

1. The air handler moves air throughout the conditioned space, and thus is a distribution vehicle for any contaminants that exist in the space.
2. The air handler itself can be a source for contaminants. Because the inside of an air handler can be both dirty and damp, it provides a source of food (dirt) for microbial growth as well as an ideal environment (damp and temperate) for the growth of microbial life.

In an air handling system, **UVGI** can be applied to coils, drain pans, and filters to disinfect their surfaces and keep bacteria from being distributed throughout a building.

What is UVGI?

UVGI stands for ultraviolet germicidal irradiation.

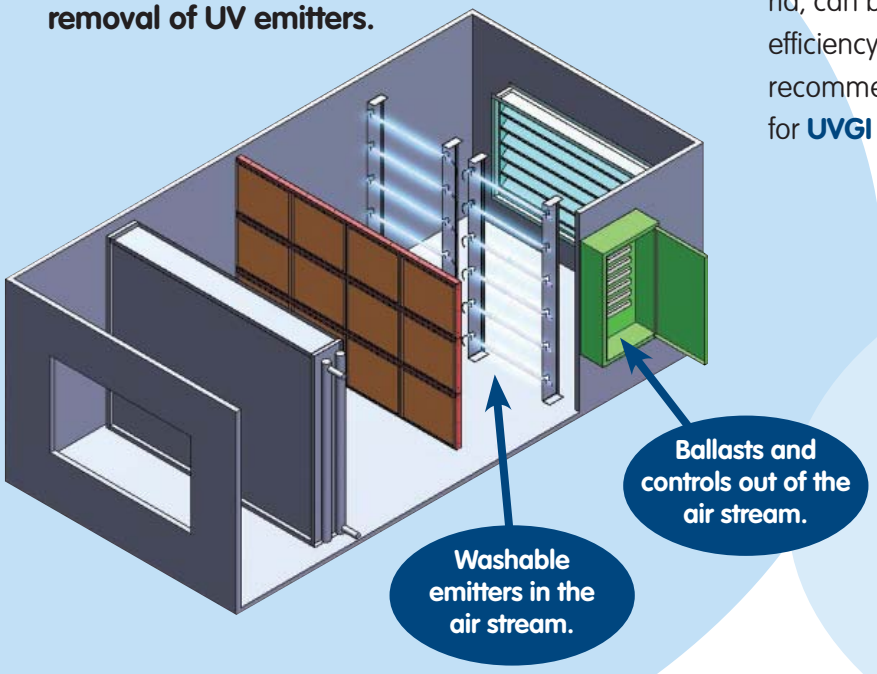
Simply put, it refers to exposing microorganisms to ultraviolet radiation in the range of 200-280 nm, known as Ultraviolet C Band, or UVC. As a result, the microorganisms are killed or disabled from reproducing.

Direct UVC exposure can sterilize any surface given enough time. Theoretically, low intensity UVC could be used for microbial growth because the exposure time is extended. In practical applications, however, microbial growth can occur in crevices, shadowed areas like insulation, and stagnant water where **UVGI** may not completely penetrate.

All viruses and almost all bacteria (excluding spores) are vulnerable to moderate levels of UVC exposure. Because viruses are contagious pathogens that come primarily from human sources, they are found in occupied buildings. Bacteria can be contagious or opportunistic, with many found indoors; however, some are environmental. Certain facilities, such as agricultural buildings, may disseminate unique types of bacteria such as spore-forming actinomycetes. Spores, which are larger and more resistant to UVC than most bacteria, can be controlled effectively through the use of high efficiency filters. The coupling of filters with **UVGI** is the recommended practice in all health care settings and for **UVGI** applications in general.

CDI Washable Emitter Construction

CDI UVGI allows washdown of the airstream and components without removal of UV emitters.



What Air Handling Applications Can Benefit From UVGI?

- **Food Processing**
- **Pharmaceutical**
- **Laboratories**
- **Schools**
- **Offices**
- **Hospitals**

CDI UVGI in Air Handler Applications

Cooling Coil/Drain Pan

Placed immediately downstream of a cooling coil, **UVGI** can effectively kill bacteria and other microorganisms that grow on these damp surfaces. Coil performance is maintained as if the coils were brand new, and maintenance is reduced to simple inspections and minimal surface cleanup.

Filtration

Filters capture dirt particles, which can be a food source for microbial growth. By utilizing a "catch and kill" strategy with filtration and **UVGI**, the offending organisms can be trapped in the filters, then killed with UVC. Properly applied **UVGI** kills bacteria and other microbial contaminants, and eliminates their recirculation through the building air stream.

Other Applications

Direct **UVGI** exposure can sterilize any surface given enough time. Air handling systems can be home for many sources of microbial contamination. CDI can provide a **UVGI** solution to any difficult disinfection requirement.

Features & Benefits

- CDI offers single-source responsibility to supply, install, wire and commission the **UVGI** system in any of our family of custom air handling systems.
- CDI's unique and exclusive water and dust tight emitter sleeve with a single electrical connection utilizes our exclusive end seal which allows the entire unit assembly to be washed down with emitters in place.
- CDI offers a true 2-year lamp which retains 80% initial output over its 17,000 hour life.

Competitors' designs have the ballast and emitter tubes manufactured as an assembly, which makes it necessary to remove the entire assembly from the airstream to wash down the air handling unit. Because the CDI system isolates the ballasts in a remote panel, they are not exposed to the airstream, and washdown is accomplished without any disassembly.

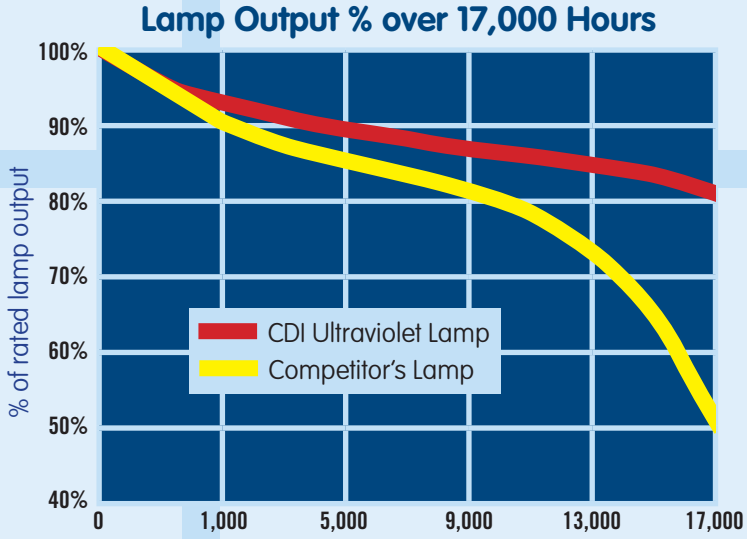
What does a 17,000 hour UVC lamp mean to you?

CDI offers a true 2-year UVC lamp which retains over 80% initial output over its 17,000 hour life.

2 years without a lamp change means:

- 50% lower upkeep costs versus replacing lamps every year
- Reduced labor requirements
- Output at the 2-year mark equal to or better than competitors' lamp output at the 1-year mark
- Better IAQ due to higher lamp output over time

The chart on the right compares two high-output UVC lamps rated for the initial output (intensity). One is a standard high-output, high mercury content UVC lamp used by our competitors, while the other is CDI's long-life low mercury "Green" proprietary lamp technology. As early as 1,000 hours (just 41 days) into lamp use, the competitors' lamps have lost at least 10% of their initial output while the CDI high-output "Green" lamp maintains 95% efficiency. This effectively gives you 16,000 hours of more stable, consistent, higher output than one gets with our competitors' high-output (800mA) or standard-output (425mA) UVC lamps.



"Green" UVC Lamps?

Many new specs are calling for "low mercury" or "Green" germicidal lamps containing < 10 mg of mercury (Hg). These lamps are attractive because "low Hg" lamps can be disposed of in normal landfills and are not considered hazardous waste. The big drawback of these "low Hg," soft-glass germicidal lamps is the fact that they are available only in standard output (425mA), which makes them less effective in quickly cleaning up fouled, mold-laden coils and hurts their ability to achieve adequate pass-by disinfection of airborne viruses and bacteria.

CDI is the first and only company to offer lamps meeting the following specification:

- ≤ 8mg Mercury (Hg)
- High-Output/800mA (standard output/425mA available for appropriate applications)
- 17,000 hour lamp life with ≤ 20% output drop from 0 to 17,000 hours

ETL-C, ETL and CE Rated

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