

A shield-shaped logo with the text "UV-C" inside, set against a background of concentric circles and light rays.

Unlocking the germicidal benefits of UV-C LED and MERV13 Filtration

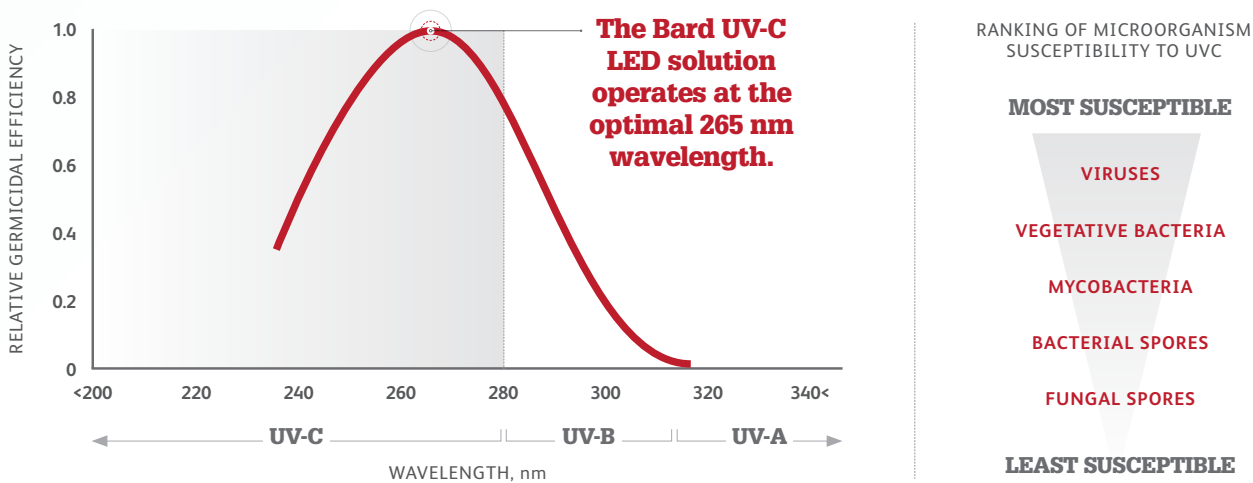
Benefits of UV-C

For more than 100 years, ultraviolet (UV) light has been used to disinfect water, surfaces and the air. Sometimes referred to as UVGI or UV Germicidal, UV-C light has been used to disinfect hospitals, kitchens, meat processing plants and laboratories. The key to the UV-C light's germicidal effects is its wavelength—which can inactivate airborne pathogens like mold, bacteria and viruses.

UV-C light has a wavelength of 100-280 nanometers. Compared to other forms of light, UV-C rays have the shortest wavelength and emit the greatest amount of energy, which gives them the capacity to disrupt the molecular structure of living cells.

Just as the UV light in sunlight can damage your skin and eyes, the wavelengths of UV light can damage or destroy the DNA inside bacteria and virus particles. The DNA damage that results keep viruses and bacteria from reproducing—and when pathogens can't reproduce inside your body, they are effectively rendered harmless.

Studies have shown that UV-C light is an effective way to kill pathogens, with peak germicidal efficiency occurring at a wavelength of 265 nanometers.



Source: 2019 ASHRAE Handbook – HVAC Applications, 62.3

Benefits of UV-C Light in HVAC Systems

- Reduces bacteria, viruses and mold in air handling systems
- Reduces the risk of cold, flu, allergies and other airborne illnesses
- Offers continuous disinfection of surfaces exposed to UV source

Benefits of UV Treatment using LED Lights

- UV LED light lifespan of 5+ years (30,000 hours), versus 1 year with other UV lamps—for reduced unit maintenance needs
- Reduced power consumption as compared to other UV lamps
- Safely disinfects the air—operating within a peak germicidal efficiency wavelength of 265 nm
- Less affected by heat and higher operating temperature
- Better for the environment and health—with no mercury or ozone emissions

Using UV-C and MERV13 Filters in HVAC

UV-C technology can be added to commercial HVAC units to improve the equipment's germicidal properties. As air is circulated through the unit, it passes through the UV-C light, which disinfects and purifies the air at a molecular level. The UV-C lights used in Bard HVAC units are odorless and silent, typically emitting a light that's invisible to the human eye.

When used inside an HVAC unit, UV-C light treatment is even more effective alongside higher filtration arrestance—such as MERV13 filters—which traps and removes particles. These complementary technologies, when used together, can improve air quality and reduce harmful airborne particles.

By integrating LED-powered UV lights and MERV13 filters, Bard has created a safe and effective solution for improving air quality. The Bard IAQ solution can expose nearly 90% of room air to sterilization within one hour of operation.

UV-C, Fresh Air Ventilation and Enhanced Filtration

Two important factors to consider when measuring indoor air quality are ventilation rate—measured by Air Changes per Hour (ACH)—and enhanced filtration, which is achieved by utilizing MERV-13 filters. Bard equipment can introduce up to 450 cfm of fresh outside air, which means the entire room can be flushed with fresh air three times or more per hour. In addition, the blower system of the Bard equipment can also filter the entire room air volume multiple times per hour.

Bard's triple-threat solution is excellent for reducing pathogens and particles in the room, leading to improved IAQ. Bard ventilation packages provide outside fresh air in amounts greater than 3 ACH, the blower system of Bard equipment pulls high levels of recirculated air through MERV-13 filters, and that recirculated air is exposed to UVC-LED lights to sterilize the air and inactivate pathogens and particles.

For example:

A 900-square foot classroom with a 9-foot-high ceiling has a volume of 8,100 cubic feet.

In 60 minutes, a Bard unit with an indoor fan operating at 1,500 cfm can give a classroom an 11 ACH, which means the entire volume of air passes through the UV-C light and filter every 5.4 minutes.



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NEW UNITS **EXISTING UNITS**

The Bard IAQ solution can be included in new units as a factory-installed feature—and can be added to existing units with our field install kits.

5-year bulb warranty on our UVC light

“To maintain good indoor air quality, providing 5 ACH is recommended. In other words, the volume of air in the indoor space should be replaced with fresh outdoor air 5 times in an hour or one time every 12 minutes.”

Healthy Buildings Program at the Harvard T.H. Chan School of Public Health*

*<https://schools.forhealth.org/wp-content/uploads/sites/19/2020/08/Harvard-Healthy-Buildings-Program-Portable-Air-Cleaners.pdf>