

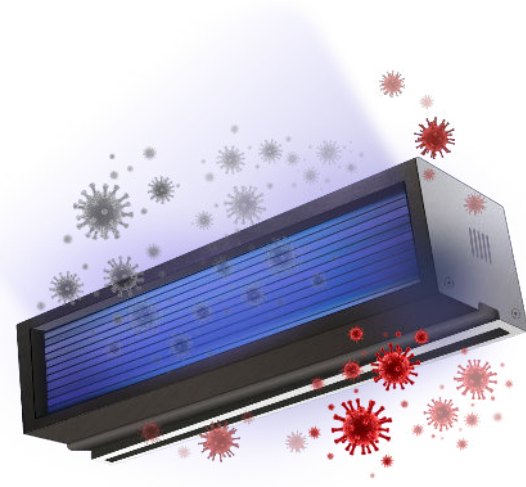
An Introduction to Conventional GUV

Overview

Germicidal ultraviolet (GUV) uses UV-C light to inactivate airborne pathogens. Conventional GUV refers to wavelengths from roughly 235–280 nm; in practice, nearly all installed systems use low-pressure mercury lamps emitting at 254 nm. This distinguishes conventional GUV from far-UVC (200–235 nm), a newer approach with different safety properties.

Direct exposure to 254 nm UV-C causes temporary eye and skin irritation, so these systems are designed to keep UV energy out of the occupied zone. In an upper-room installation, shielded fixtures direct UV into the air above head height, and irradiance at occupant level is measured at commissioning to confirm it stays within published exposure limits.

Separately, effectiveness depends on air mixing, as the system only disinfects air that actually reaches the irradiated upper zone. Upper-room GUV has the strongest evidence base of any in-room air treatment technology, built over decades of use against tuberculosis and measles, and it works the same way against novel respiratory pathogens because the mechanism doesn't depend on knowing the pathogen in advance.



How It Works

Upper-room GUV devices use UV light to inactivate pathogens in the air by damaging their genetic material so they can no longer cause infection. Room air moves continuously between the occupied zone and the irradiated upper zone through normal convection and air mixing — thermal plumes from people and equipment, HVAC supply and return, and, in some cases, low-speed ceiling fans. Each pass through the upper zone inactivates a fraction of the pathogens carried in that air.

Considerations for Use

While this technology is promising, there are several considerations that need to be reviewed prior to installation:

- **Design, Installation, and Commissioning** — These systems require professionals trained specifically in GUV design and safety verification, including measuring occupied-zone irradiance to confirm compliance with exposure limits. Certification programs are offered by NALMCO or an equivalent organization.
- **Ventilation and Filtration Capacity** — These systems can be especially useful in spaces where ventilation or filtration is limited, difficult to improve, or not enough to meet indoor air quality standards (e.g., ASHRAE 62.1).
- **Room Type** — Rooms with sufficient ceiling height, often at least 8 feet, are generally better suited for these systems. Spaces with open ceilings or unusual layouts may require additional review.

What's Next

Blueprint Biosecurity is exploring additional pathways to help advance the workforce, standards, and market readiness needed for broader conventional GUV system deployment.