According to Jones and Ivanovic (2020). For nearly a century, short-wave ultraviolet (UV) C (UV-C) energy that is like sun rays has been used to destroy airborne and surface-bound microbes, including chickenpox, measles, mumps, tuberculosis (TB), and cold viruses. Yet, despite decades of research and thousands of applications in hospital emergency and operating rooms, urgent-care centers, universities, and first-responder locations, UV-C has not been widely leveraged. The coronavirus disease 2019 (COVID-19) pandemic, however, is highlighting UV-C’s potential as an effective air and surface disinfectant. UV light is a band of electromagnetic radiation classified into four wavelength ranges: vacuum UV (100 to 200 nm), UV-C (200 to 280 nm), UV-B (280 to 315 nm), and UV-A (315 to 400 nm). Wavelengths from 100 nm to 280 nm are germicidal. At 253.7 nm (commonly referred to as “UV-C”), the UV wavelength changes the structure of DNA and RNA, the genetic code of all life forms, inhibiting the ability of cells to reproduce. While bacteria and viruses absorb UV-C energy at different rates, no microorganism tested to date has proven resistant when subjected to an appropriate dose.

UV-C can supplement protocols for disinfection, sterilization, and manual cleaning, providing a level of protection in the event a protocol fails. Facility managers are encouraged to implement a layered approach incorporating multiple infection-control measures to ensure that any pathogen that cannot be removed by one method (e.g., filtration, cleaning) is inactivated by another (UV-C). The target pathogen and its susceptibility to UV-C. The amounts of UV-C energy needed to inactivate individual bacteria, viruses, and spores have been identified through decades of research.

The lamps using more, or higher-output lamps will increase the total dose that is, the microwatt-seconds per square centimeter (µW-s/cm²). Lamps with 360-degree irradiation allow more UV-C energy to saturate a plenum, increasing UV-C fluence. Some UV-C lamps are encapsulated with an anti-shatter fluorinated-ethylene-propylene (FEP) coating or outer sleeve that helps to insulate the lamp surface from changes in temperature and/or air volume. This protection can be beneficial when the temperature is low and/or the air-stream velocity is high, but it also can reduce UV output by up to 10 to 12 percent.

UV-C for HVAC Air and Surface Disinfection, accessed 31 March 2022, <<https://www.amca.org/educate/articles-and-technical-papers/amca-inmotion-articles/uv-c-for-hvac-air-and-surface-disinfection-2.html>>