



15 March 2021

Dr Tedros Adhanom Ghebreyesus
Director General
World Health Organization

Dear Dr Tedros

UV-C Disinfection Technology

The Global Lighting Association is the voice of the lighting industry on a global basis.

Ultraviolet C (UV-C¹) disinfection technology is an efficacious adjunct to preventive non-pharmaceutical intervention (social distancing, hand hygiene, face masks) to reduce contamination by neutralizing the SARS-CoV-2 virus. UV-C disinfection in an indoor environment reduces the viral load and hence decreases risk of infection. Its efficacy extends to almost all indoor locations.

The Global Lighting Association respectfully requests the World Health Organization to promote use of UV-C disinfection technology indoors in the battle against the COVID-19 pandemic. There is also a longer-term interest at stake, as the technology can be an important tool in mitigating other current and future airborne pathogens.

UV-C is a mature technology

UV-C disinfection is an established technology for disinfection. It has been applied for many decades since it was discovered to be an effective tool in preventing the spread of contagious diseases through disinfecting water, surfaces and air in very short time periods [1]. UV-C inactivates viruses and microorganisms such as bacteria, moulds, spores, fungi and yeasts by damaging their DNA or RNA genomes and inhibiting replication. UV-C is generated by long-known lamp manufacturing and light generation technologies [2]. It is easily controllable and chemical free, therefore more environmentally friendly than various other disinfectants [3].

UV-C is effective for disinfection

UV-C radiation has been proven to inactivate all micro-organisms and viruses against which it has been tested including, among others, those causing tuberculosis, influenza and SARS [4]. In relation to COVID-19, several scientific reports have been published showing rapid and effective inactivation of SARS-CoV-2 by ultraviolet-C. [5] Notable in this respect are the peer-reviewed scientific report in

¹ Ultraviolet C is part of the non-visible optical radiation spectrum, classified by wavelengths in the range 100 nm to 280 nm.

the journal *Nature* by the National Emerging Infectious Diseases Laboratories at Boston University [6], the peer-reviewed scientific report in *American Journal of Infection Control* by Infectious Diseases Departments of Hiroshima University [7] and the preprint on *medRxiv* with contributing department of Biomedical and Clinical Sciences of University Milano [8].

Safe use of UV-C is enabled by existing standards and industry guidelines

The potential hazards (irradiance exposure, ozone production and material degradation) associated with the use of UV-C are now well understood, and proper protective measures are described in international standards and guidelines. The Global Lighting Association published UV-C Safety Guidelines in May 2020 [9] [10]. The guidelines assist light source and product manufacturers ensure that UV-C products are manufactured, installed and supplemented with appropriate instructions for safe use [11].

UV-C disinfection indoors can take various forms depending on application

- **Upper-room UV-C systems and UV-C in recirculating air disinfection units can inhibit likely airborne transmission routes in occupied spaces.** Natural air flow resulting from movement, temperature changes and recirculating air-conditioning in indoor spaces contributes to the rapid spread of viruses such as SARS-CoV-2. High-output UV-C systems in the upper space of rooms or in UV-C recirculating air disinfection units can reduce the concentration of infectious viruses in the air while preventing human exposure to UV-C irradiation.
- **UV-C irradiation in HVAC systems keeps cooling coils free of infectious biofilm in heat exchangers, disinfects surfaces and disinfects the air flow.** Treatment within the air distribution systems can inactivate viruses and pathogens, thereby reducing the transference from one room to another.
- **Surface UV-C disinfection systems are an effective and established method of reducing infection rates in unoccupied spaces.** Fixed and mobile high-output UV-C surface disinfection units have been used for many years to reduce the incidence of infections - for example, in hospitals. Surface disinfection employing UV-C systems has been successfully applied to quickly inactivate various pathogens such as MRSA. UV-C systems for surface disinfection can also disinfect surrounding air and as such perform simultaneous air and surface disinfection.
- **Whole room direct disinfection below exposure limits in occupied spaces.** Low-output UV disinfection can be performed in a manner that is below exposure limits to inactivate viruses and pathogens in air either as a primary method or in combination with other methods.

Recommendation

Although both the World Health Organization and the US Centers for Disease Control have recommended the use of upper-room UV-C systems as a supplemental air-cleaning measure to reduce transmission of airborne bacterial and viral infections in public buildings, hospitals, military housings and classrooms [12] [13] [14], UV-C disinfection technology is not listed in WHO recommendations as non-pharmaceutical intervention in non-domestic indoor places in the battle against the COVID-19 pandemic [15].

The Global Lighting Association requests the World Health Organization to add the four forms of safe UV-C application solutions described in this letter to their list of recommendation as a non-pharmaceutical intervention for indoor use. National health organisations frequently follow the specific set of recommendations contained in the COVID-19 interim guidance referenced above and do not always find additional recommendations from other WHO publications.

The Global Lighting Association is willing to offer its support and partnership relating to UV-C technology.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Bryan Douglas', with a large, stylized flourish at the end.

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