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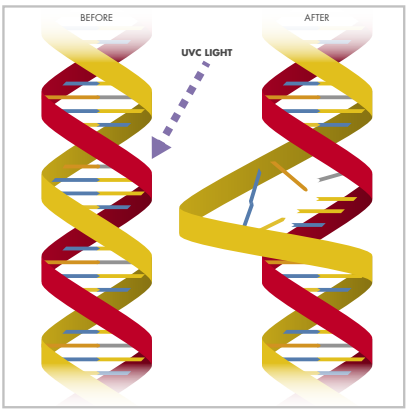
UVC LED Disinfection

How UVC radiation makes the Coronavirus harmless

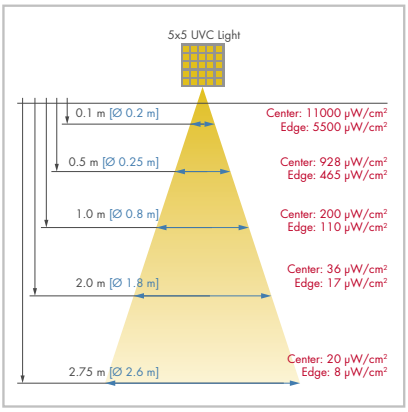
Like all viruses, the corona pathogen SARS-CoV-2 can only reproduce with the help of a host. Cells infected by the virus are "reprogrammed" by its ribonucleic acid (RNA) to produce new viruses. These are released in the body and infect other cells. The host cells are destroyed by the reproduction process, causing diseases in the host body. Since each virus only attacks certain cell types, different disease patterns are triggered; in the current epidemic, for example, the respiratory organs are affected.

UVC is high-energy, short-wave radiation with a wavelength range between 100 and 300 nm. It is absorbed by the RNA strands of the virus causing their nucleotide sequences to clump together. This prevents the cells from reproducing or kills them. In both cases, the virus is no longer dangerous as it causes damage only by multiplying.

The natural UVC radiation of sunlight is absorbed by the ozone layer of our atmosphere, and neither organisms nor viruses have developed protective mechanisms. Irradiation with artificially produced UVC is a particularly effective method of disinfection. However, the radiation loses its effectiveness at shorter distances from the optical sources. The distance for optimal disinfection success is under 100 cm. At this range, sufficient dosage can be achieved. With smart targeting and controlled illumination, this assures success without posing any danger to humans who occupy adjacent space because the operator is "out of reach".



UVC radiation destroys the nucleic acids, thus rendering the virus harmless.



UVC can quickly and effectively disinfect objects placed within 1 meter of the LED array.

USA
Laser Components USA, Inc.
Tel: +1 603 821 – 7040
Fax: +1 603 821 – 7041
info@laser-components.com
www.laser-components.com

FAQ's about UV-C LED Disinfection Tent: Answers from an Expert

With a short 30 second "light shower", doctors and nursing staff can disinfect themselves quickly and efficiently after caring for Corona-virus patients. The pathogen thus remains in the isolation ward and the risk of infection to themselves and outsiders is reduced. Peter Gordon, Business Development Director for Germicidal UVC LED manufacturer Bolb, Inc. answers important questions.

What exactly does the disinfection facility look like?

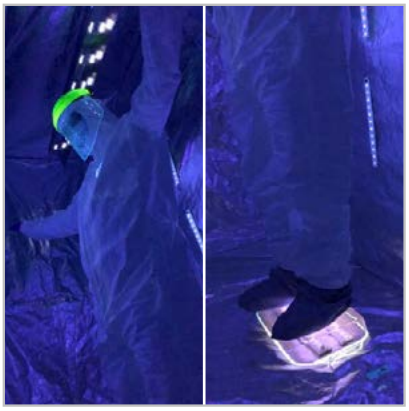
It is a softshell compartment of 2.0x0.75x1.5 m (L/W/H). Powerful UVC LED arrays are low profile mounted on the reflective ceiling and walls. In addition, there is a floor plate with the same emitters on which a person stands during decontamination. With a simple and suitably safe DC supply, the tents are easily set up and mobile, making them ready for immediate use. A more compact version may be constructed, and – along with novel methods – used to disinfect critical face masks which are now in short supply. Objects now include contaminated frontline healthcare worker N95 masks, face shields, gloves, and gowns as well as potentially compromised UPS and Fed Ex delivered packages to homes.



One 5x5 LED Array from Bolb provides powers up to 2.5 W.

What power do the LEDs work with?

In the tent, a continuous, uniform intensity of 200 µW/cm² is generated. During the 30 second exposure time, a dose of 6 mJ/cm² is delivered. For viruses that have a similar structure to the corona pathogen SARS-CoV-2, validation tests by microbiologists have shown that a reduction rate with the value of $\log_{10}4$ - i.e. 99.99%, is achieved. This is considered effective and sufficient disinfection, safeguarding healthcare workers.



After 30 seconds, the protection suit is germ-free.

Which wavelengths are used?

The Germicidal UVC LEDs from Bolb, Inc. emit UV light with wavelengths from 265 to 280 nm. In this range, electromagnetic radiation is well absorbed by the RNA of the viruses, destroying their infectious genetic information. The virus can no longer spread and infect, rendering it harmless.

Is UV radiation dangerous to humans?

Yes. UVC radiation can cause burns on unprotected skin. In the case of Coronavirus disinfection, the primary concern is keeping the protective suits worn by medical personnel, uncompromised. During exposure, doctors and nursing staff are protected by the suit. For safety reasons, a reflective strip is attached to the protective visor which begins to glow under UV light, ensuring that the decontamination chamber is activated long enough to produce the desired results.

Please contact LASER COMPONENTS with any further questions.

USA
Laser Components USA, Inc.
Tel: +1 603 821 – 7040
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info@laser-components.com
www.laser-components.com