



PURE LIGHT LED PRODUCTS



# ADAPTING THE NEW NORMAL

## HOTEL CERBERUS™ BIO-DEFENCE SOLUTION



Pure Light Led Products is a South African manufacturing company. Over lock-down period new range of Ultraviolet Germicidal Disinfecting products was developed and certified, specifically designed to combat air-borne diseases such as Covid19, TB, Measles, Flu etc. UV-C radiation is a known disinfectant for air, water and surfaces that can help mitigate the risk of acquiring infection

Suite of products specifically designed to keep air consistently clean and surfaces disinfected, serving as proactive and preventative solution to minimise air-borne and surface virus transfer



## PROBLEM

Research conducted by various scientific institutions ( among others TOHO University\* in Japan and AALTO University\* in Finland), shows that when person continuously breathing, speaking, sneezing or coughing, an aerosol cloud is emitted. Hundreds of thousands of aerosols can be generated within a few minutes. Most of the heavier droplets falls on the ground within one minute, contaminating surfaces. Micro-droplets (1/10 000 of 1 millimeter) can drift in the air for a long time, if no air movement is present. If aerosols contains high concentration of viruses or bacteria and if they are inhaled for long enough, the chance of infection will increase

Air conditioning will worsen situation, as enforced air flow will spread contaminated aerosols evenly throughout the premises

Keeping windows or doors open help to clean air, but its not always possible due to weather conditions

### *References:*

\* AALTO University Research

<https://www.youtube.com/watch?v=ajHK0Nt-GrM>

\* TOHO University Research

<https://www.youtube.com/watch?v=H2azcn7MqOU>

## SOLUTION

Coronavirus is an air-borne disease and thus virus should be intercepted and neutralised while it in the air, before it reach and contaminate surfaces or get inside of a human organism. UV-C rays are lethal to viruses and bacteria, as it destroys links in their DNA

Rate of air circulation & disinfection plays crucial role in reduction of possible disease transfer. Even during current pandemic commercial aircrafts flying at full capacity, with every seat and row occupied by passengers. How is that authorities worldwide permitted 100% occupation during flights? Answer is that air being constantly filtered and disinfected during flights, reducing risk of air-borne particles flying around\*

In the same way as GP prescribes to patient multiple drugs to treat illnesses, multiple devices creating multiple lines of defence can stop virus and prevent it from spreading

Devices to be placed/installed in “hot spots” areas, e.g. places with high chances for disease transfer - reception, restaurants, lobbies, as well as in hotel rooms to provide fast and efficient way to keep room environment clean and healthy, especially in preparation of the room before new guest arrival

Every device designed to be energy efficient and will not have a significant impact on the practice electricity bill



Solution endorsed by the SOUTH AFRICAN INDEPENDENT PRACTITIONERS ASSOCIATION





# HOW SAFE IS AIR TRAVEL?\*

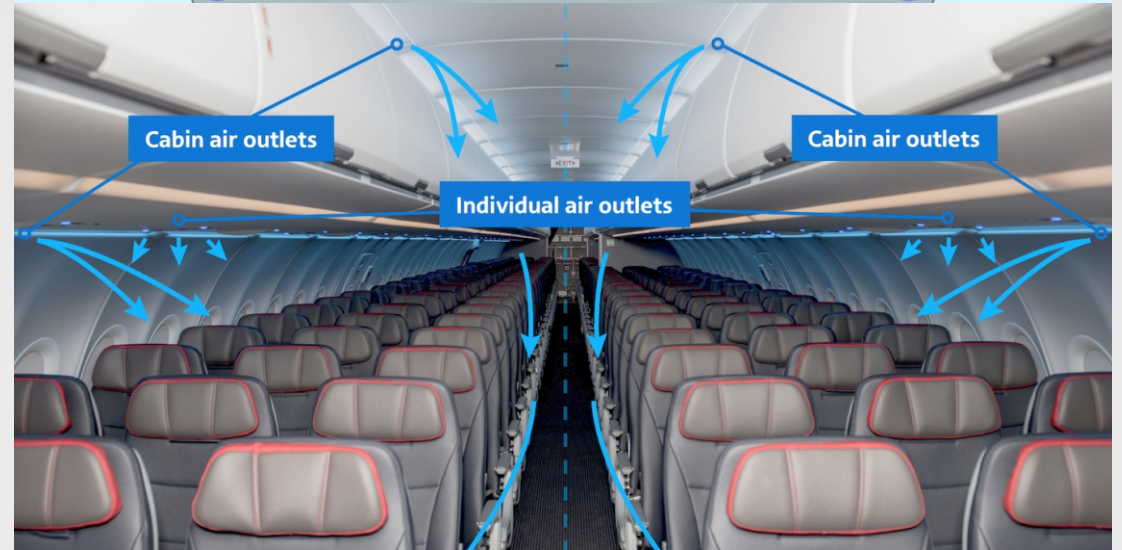
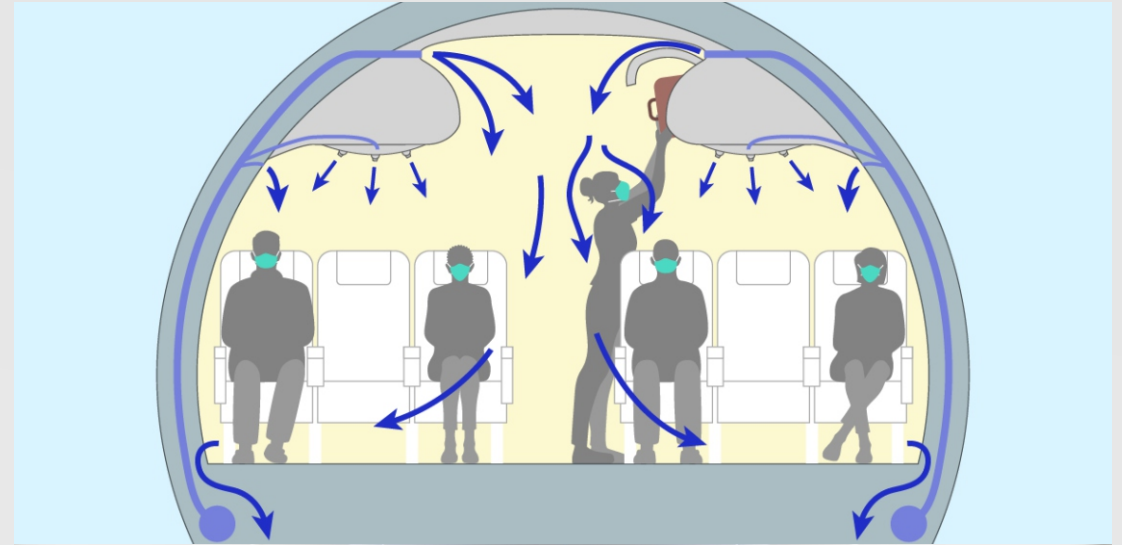
At first thought, a narrow metal tube in which strangers are crammed together for hours might seem like a flying petri dish, especially during a pandemic. The reality is a bit more nuanced. While there are risks associated with flying, it may be safer than you think. For starters, the air quality on a commercial airliner is actually quite high, with the air volume in the cabin being completely refreshed every two to four minutes.

Once air leaves the cabin, about half is dumped outside, and the rest is sent through HEPA (high-efficiency particulate air) filters, similar to those used in hospitals, before being mixed with fresh outside air and entering the cabin again. Of course, passengers and crewmembers moving up and down the aisles can disrupt this airflow, altering the path of any airborne particles. And while the HEPA filters used in commercial aviation can filter out 99.97% of virus-sized particles, they can't capture every respiratory droplet or viral aerosol before someone else inhales it.

Still, the design of air-handling systems on commercial aircraft makes it unlikely that you'll be breathing in air from anyone more than a few rows away. In fact, a 2018 study that examined the transmission of droplet-mediated respiratory illnesses during transcontinental flights found that an infectious passenger with influenza or another droplet-transmitted respiratory infection was highly unlikely to infect passengers seated farther away than two seats on either side or one row in front or in back.

And that was without masks.

\* <https://medical.mit.edu/covid-19-updates/2020/09/how-safe-air-travel>



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# INVISIBLE WALL

Cerberus® Invisible Wall UV-C lamp (patent pending) is a desk based device designed to separate parties with an “invisible wall” of disinfecting UV-C light, as well as with vertical curtain of air flow. Any contagious particles (bacteria, viruses) expelled by potentially infected person on the other side of the table and floating in the air, will be destroyed or severely weakened at the moment of UV-C light crossing. Particles will also be pushed upwards with the flow of air. Device creates narrow vertical curtain in vertical projection, with about 170 degree coverage sideways, with the maximum efficiency at radius of about 30cm. Built-in fan constantly circulate and disinfect air from both sides (suck from the sides and push cleaned air upwards)

Safety measures to be taken when using this lamp, to avoid accidental direct exposure to skin and eyes (don't look inside). Recommended distance of 30cm from the device is advisable

To be positioned at the Receptionist desk to protect staff from potentially infected guests



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# UV-C CEILING LAMP

Cerberus® Ceiling UV-C Lamp is an open type device for ceiling installations, designed for air re-circulation and upper room free-flowing air disinfection. Dual function of sideways irradiation via open louvers for the upper room disinfection and active inflow of air from below area with an immediate disinfection of passing air

Installed at minimum height of 2.7m (average ceiling height in every building) it completely safe for people below. Device designed to be used during a day with people present, constantly circulating and disinfecting air in premises. Ideal for installation in doctor's room above consultation desk, complimenting of functionality of the Invisible Wall device (catching pushed upwards air)

Smallest device on just 7,2W of power consumption (stronger units available for bigger and higher ceilings premises) has level of air circulation of 68 m<sup>3</sup> an hour, so in room size 3m x 3m with ceiling height of 2.7m air will be circulated and disinfected about 2.8 times per hour. Working together with an Invisible Wall device air will be circulated and disinfected in such a room approx. every 11 minutes



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# UV-C HANDHELD LAMP

Cerberus® Handheld UVC lamp for manual disinfection of surfaces, groceries or any other objects in close proximity. Level of UV-C irradiation at 5cm - 10cm is sufficient for fast disinfection of surfaces on which ultraviolet light is exposed

Ideal for replacement of chemical based disinfectants, as it can be used on appliances, furniture, keyboards, computers, phones, papers, etc., e.g. where wet liquid solution can cause damage

Safety measures to be taken when using this lamp - do not point to people or animals, avoid contact with exposed skin or eyes



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# UV-C SURFACE LAMP

Cerberus® UV-C Surface is open type lamp for surface installation (wall, ceiling), designed for open space free-flowing air and surface disinfection. UV-C irradiation is emitted above the horizontal plane or directed by the reflector

Installed on the wall or ceiling, exposing UV-C light to objects below. Ideal for fast hotel room's surfaces disinfection (floor, walls, furniture and any other objects exposed to the light), replacing Fumigation process

Safety measures to be taken when using this lamp to avoid exposure to staff and guests (movement sensors and/or timers switching ON/OFF lamp)



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# RECEPTION

## Example of Reception Room:

**UV-C Ceiling Air Recirculating Devices.** Positioned above reception and guest's seating area. Size/strength of devices determined by the area volume and desired circulation rate.

**Invisible Wall** devices positioned at receptionist desk behind plexiglass screen will provide protection for staff working at Reception desk

**UV-C Handheld** device will provide on-site immediate disinfection for paperwork, credit cards, keys etc.



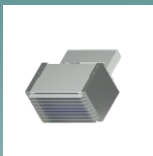
### UV-C CEILING

Mounted on ceiling to actively circulate air, as well as irradiate upper room area. Number and strength of devices determined by room volume



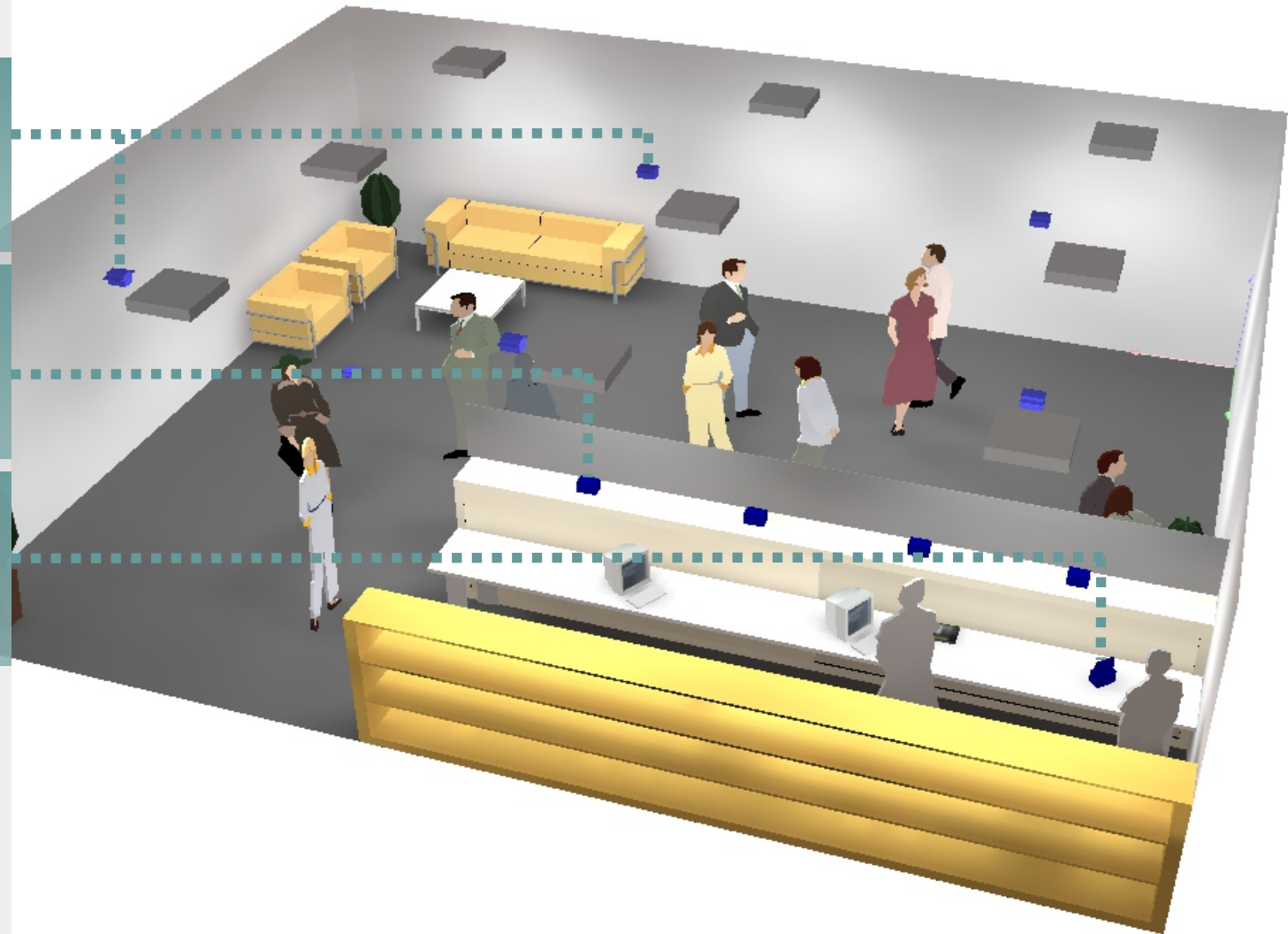
### UV-C INVISIBLE WALL

Placed on receptionist desk to separate staff and guests. To be installed with an additional clear plexiglass screen



### UV-C HAND HELD

Used to disinfect desk surface, paperwork, credit card machines & credit cards, cash, keyboards, etc.



# OFFICE

## Example of Office Room size 6m x 12m:

**3 x UV-C Ceiling Air Recirculating Devices.** Mounted on the ceiling above “hot-spot” areas, such as visitor’s seating area, meeting table and worker’s desks. Size/strength of devices determined by the room volume and desired circulation rate. For example 3 x 25W/136m<sup>3</sup>/h devices will circulate air in the room approx. every 28 minutes

**2 x UV-C 25W Surface** devices to disinfect unoccupied office area overnight. Mounted on the ceiling in positions where they can evenly cover premises and using timer switch, they will switch ON/OFF during night hours. It would take approx. 4 hours to disinfect exposed room’s surfaces

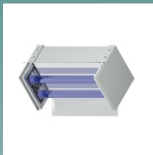
**1 or 2 Invisible Wall** devices positioned in the middle of the meeting desk will provide protection for meeting participants

**1 x UV-C Handheld** device will provide on-site immediate disinfection for paperwork files, furniture, computers etc. surfaces



### UV-C CEILING

Mounted on ceiling to actively circulate air, as well as irradiate upper room area. Number and strength of devices determined by room volume



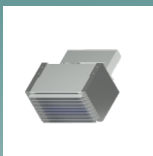
### UV-C SURFACE

Mounted on ceiling with UV-C tube exposed to objects below. Switched ON during night time only to disinfect floor, walls, furniture etc.



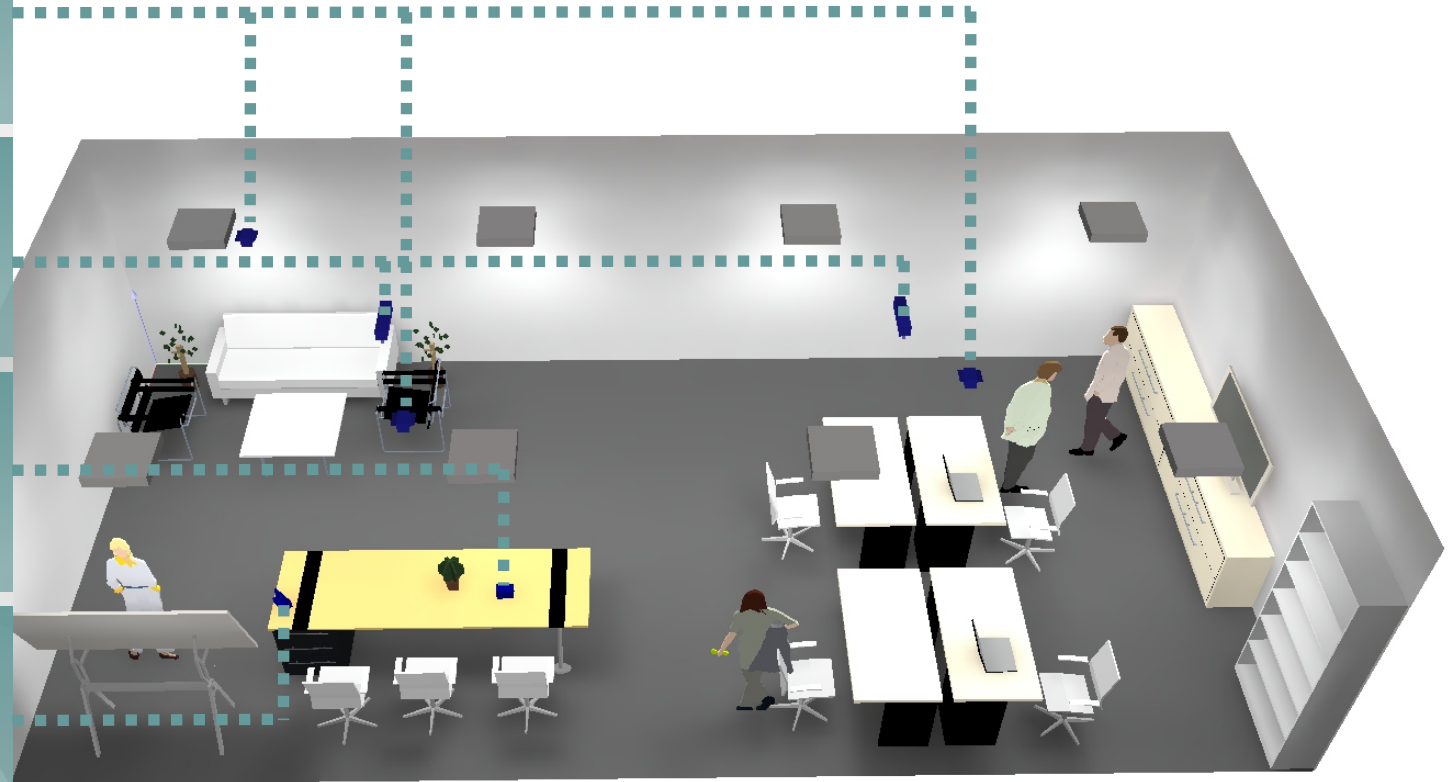
### UV-C INVISIBLE WALL

Placed on meeting table to separate meeting participants



### UV-C HAND HELD

Used to disinfect desk surface, paperwork, keyboards, printers, etc.





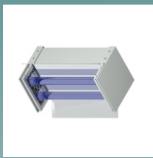
# MEETING ROOM

Example of Meeting Room size 5m x 3m:

**1 x UV-C Ceiling Air Recirculating Devices.** Mounted on the ceiling above meeting table. For example one device power consumption of 25W will circulate air in the room approx. every 18 minutes

**1 x UV-C 9W Surface** device to disinfect unoccupied rooms overnight. It would take less than 3 hours to disinfect room exposed surfaces

**2 x Invisible Wall** devices positioned in the middle of the desk to separate meeting participants. With both devices running, air will circulate in the room every 8 minutes



## UV-C SURFACE

Mounted on ceiling with UV-C tube exposed to objects below. Switched ON during night time only to disinfect floor, walls, furniture etc.



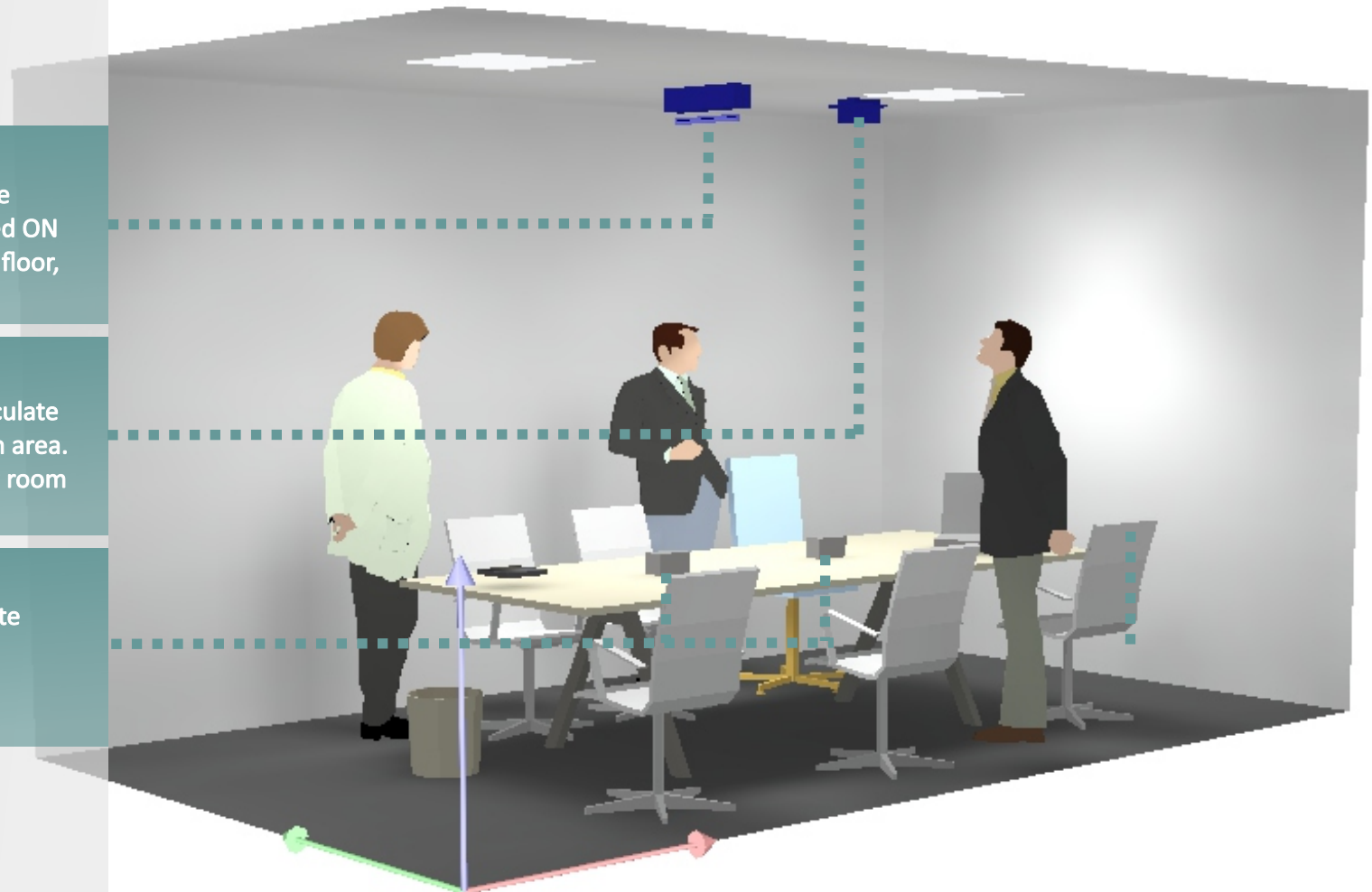
## UV-C CEILING

Mounted on ceiling to actively circulate air, as well as irradiate upper room area. Number of devices determined by room volume



## UV-C INVISIBLE WALL

Placed on meeting table to separate meeting participants



# HOTEL ROOM

Example of Consultation Room size 5m x 3m:

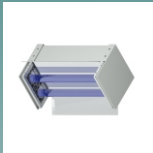
**2 x UV-C Ceiling Air Recirculating Devices.** Positioned above leaving areas. Each device power consumption 7,2W will circulate air in the room approx. every 21 minutes

**UV-C 25W Surface** devices to disinfect unoccupied rooms during cleaning process. It would take less than 45 minutes to disinfect entire room exposed surfaces



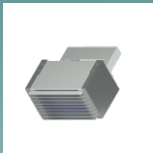
## UV-C CEILING

Mounted on ceiling to actively circulate air, as well as irradiate upper room area. Number of devices determined by room volume



## UV-C SURFACE

Mounted on ceiling with UV-C tube exposed to objects below. Switched ON during cleaning period only to disinfect floor, walls, furniture etc.



## UV-C HAND HELD

Used by cleaning staff to disinfect surface, bathrooms, phones, remote controls etc. during cleaning process





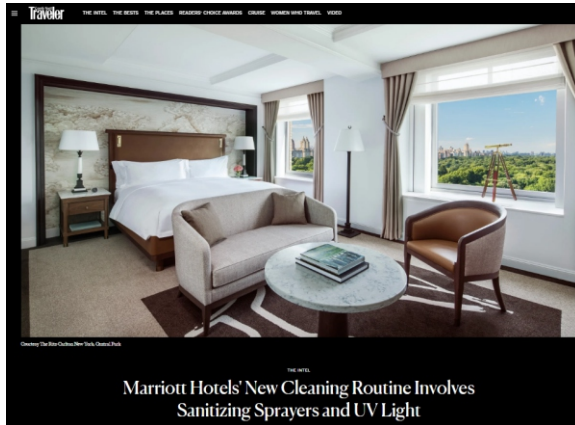
# CASE STUDIES AROUND THE WORLD



## Hotel uses UV lights to clean up

Best Western Hotels using ultraviolet, black lights to clean hotel rooms.

<https://www.youtube.com/watch?v=-759xVpwkxQ>



## Marriott Hotels' New Cleaning Routine Involves Sanitizing Sprayers and UV Light

Much news has been made of airlines' new and improved disinfecting routines—including fogging, or spraying a high-grade disinfectant, throughout the cabin and wiping down high-touch points—and how the coronavirus-induced changes will stick around after the pandemic ends. But few updates have come from hotels, many of whom are open, albeit with significantly fewer guests. Now, Marriott International has made the first move, announcing a new cleanliness plan that will roll out over the next few months across its more than 7,000 hotels, which include the Ritz, W, Westin, and Aloft brands.

<https://www.cntraveler.com/story/marriott-hotels-new-cleaning-routine-involves-sanitizing-sprayers-and-uv-light>



## UV light to a hotel's rescue

Founded earlier this year, the Singapore-based company, Smart Spruce, uses a UV-C sterilization Smart Light with Artificial Intelligence IoT cleaning that meets hygiene and safety demands. The cloud-connected system monitors cleanliness and generates alerts with key parameters such as occupancy, humidity, volatile organic components (VOCs), particles in the air, and cleaning schedules. Centred around the 253.7nm low-pressure mercury UV-C light bulb technology the system can sterilize 200 rooms simultaneously within 35 minutes <https://www.ttrweekly.com/site/2020/10/uv-light-to-a-hotels-rescue/>



# FAQ

## **Can UV-C light prevent COVID19 transmission?**

Ultraviolet radiation of C band (UV-C) is the most effective sterilizing remedy (in range between 200nm to 280nm), as organisms with damaged DNA can't replicate. During 2020 research conducted by many scientific organisations confirmed efficiency of UV-C against COVID19 virus. Research centers not limited to include: IUVA, the International Ultraviolet Association, a non-profit organization dedicated to the advancement of ultraviolet technologies; ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers; IES - established in 1906, the recognized technical and Educational authority on illumination, and many others scientific and research centers and test labs worldwide

## **Design Standards**

In medical area UV-C is a familiar technology (invented back to 1877), as it used for decades for disinfection in ICU, surgeries, other medical facilities. Devices designed according to SABS and European CE standards. Measurements verified and confirmed by testing conducted at NMISA (National Metrology Institute of South Africa). Devices obtained CE certification (equal to South African SABS standards and acceptable in South Africa)

## **Support**

Support can be provided at planning stage to determine correct type, strength, quantity and installation location for every device.

## **Benefits:**

- Set of devices will protect staff and visitors from getting infected by each other. Besides saving lives (!), reduction in sick leave among staff will bring direct economical benefit
- Long term universal protection against currently known airborne diseases, not only COVID19, but TB, flu, measles etc.
- Better chances to face-off against any new future pandemic (Covid19 pandemic will not be the last: WHO chief)
- Hand held device for surface disinfection is easy plug&play device and can replace chemical spray based solutions
- Premises should be disinfected on daily basis and chemical based fumigation process can be quite costly, if done frequently. UV-C based disinfection can be done as often as necessary without incurring any additional costs
- Guests, knowing that hotel implemented improved bacteriological defensive measures, will be inspired to choose hotel for their staying. Improved turnaround rate resulting in increased revenue





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