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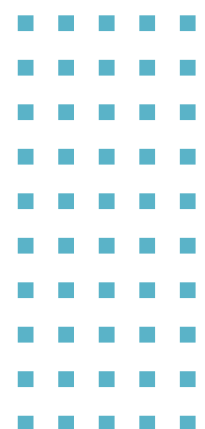
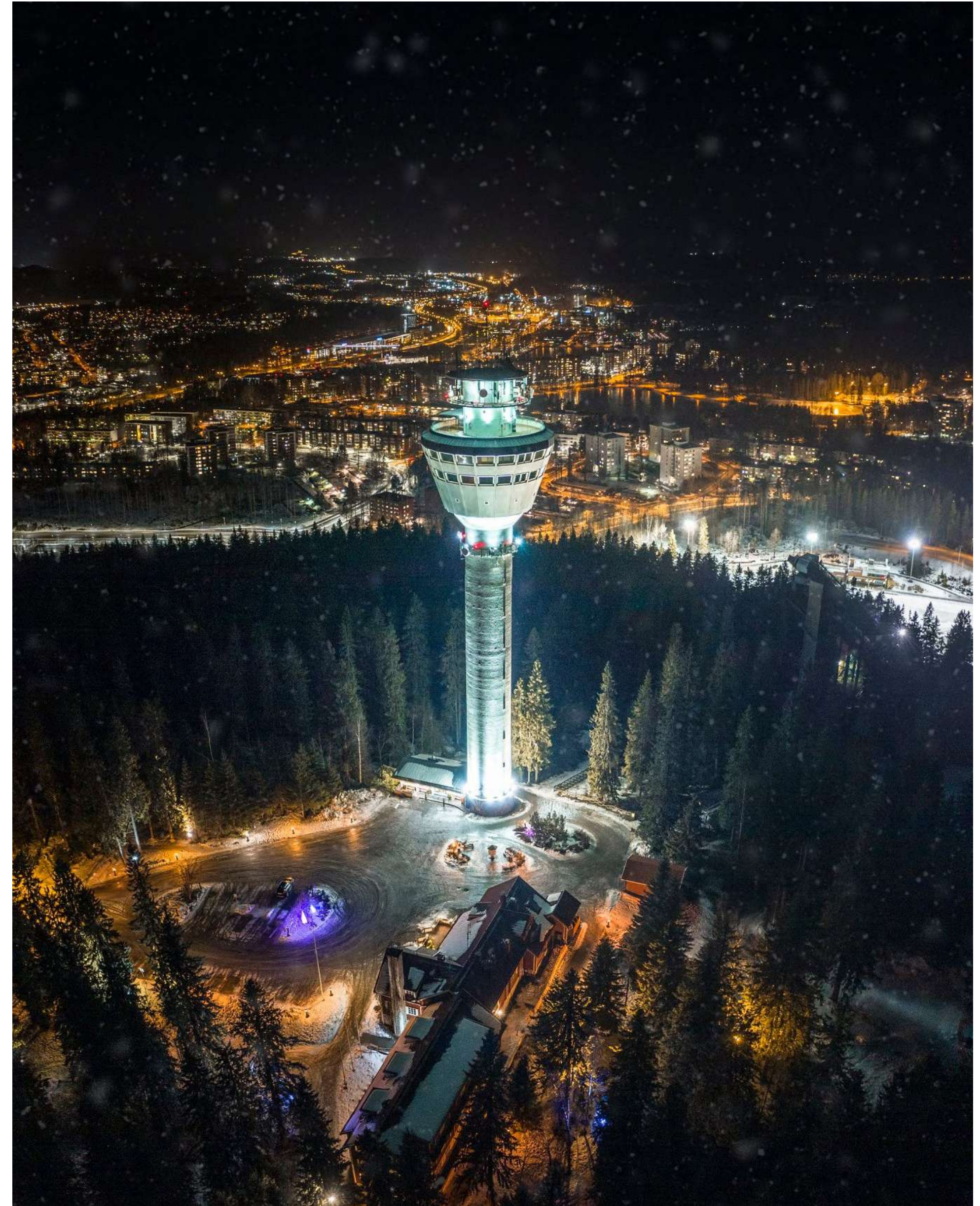
Introduction

LED Future

LED Future is founded and run by leading biologists, physicists, physicians and engineers. The first LED Future products for professionally disinfecting bacteria were sold over seven years ago through our early-stage research & development company.

LED Future Oy, established in 2017 in Finland, develops new disinfection technology products for a wide variety of uses. Our disinfection solutions created with UVC-LED technology are ecological, energy-efficient and long-lasting. LED Future devices are easy to use and easy to design for customers.

LED Future customers can be found across five continents. We are located in Kuopio and Varkaus, Finland.





Award-winning Patented Products

Patented products

We hold several internationally awarded patents for our LED Future products with more patents pending for our latest products.

LED innovation

Alongside the continuous development cycle of existing LED Future products, we have an innovation pipeline for further new products with a variety of uses in several sectors.

Award-winning products

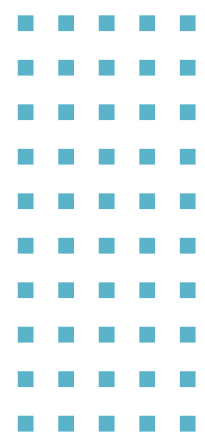
IQ Mobile won a prestigious European innovation product challenge already in 2015.

Ongoing support & maintenance

LED Future offers direct support. Our products do not require any maintenance.

Consulting: customizing

LED Future offers a variety of customized consulting options to suit the individual requirements of our valued clients. Send us your blueprints, and we will customize our product innovations to match your needs.



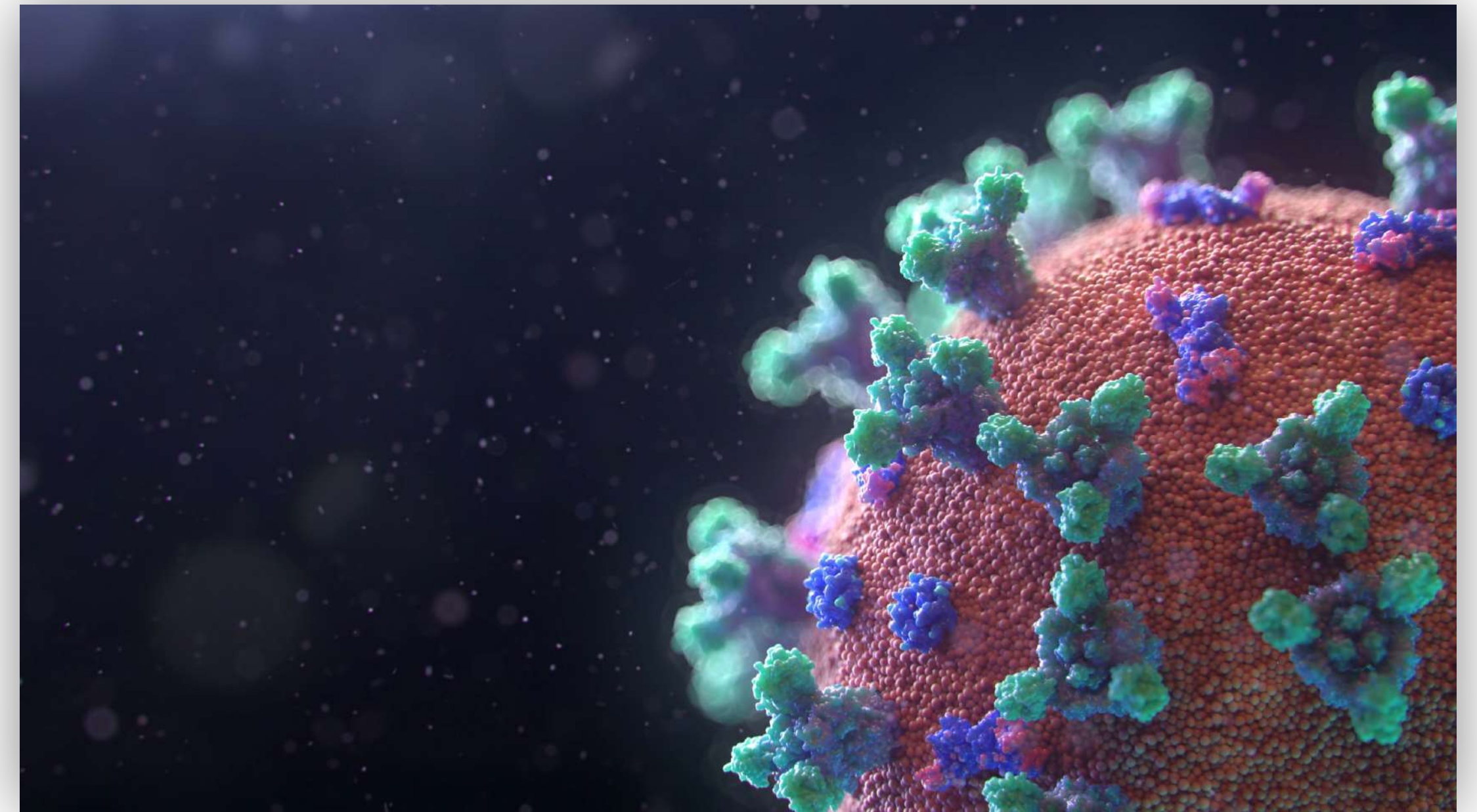
How UV LED technology works

NO CHEMICALS, NO HEAT & NO LIQUIDS: environmentally friendly, energy-efficient, kills microbes in seconds.

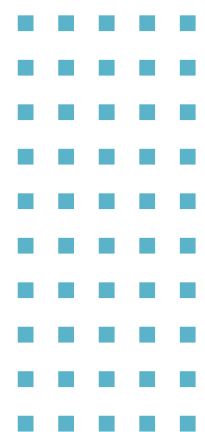
The UVB and UVC light kills the microbes. The ozone layer prevents UVB and UVC light from entering the ground. For this reason, microbes can't withstand these frequencies of light.

UVC light destroys the DNA chains of microbes. Powerful UVC-LED also kills the so-called SUPERBACTERIA and CORONAVIRUS.

Disinfection with UVC-LED technology is a new method with a vast potential for different uses. It cleans the air, various surfaces and materials, as well as liquids.



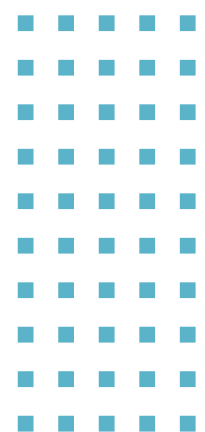
In the exposure unit, the subject is illuminated with a suitable UV light wavelength and illumination time to achieve the desired results. UV light works practically against all the microorganisms. UV light changes the biological properties of cells by breaking down the structure of the DNA and RNA.





The advantages of LED compared with traditional lamps in producing UVC

- Much longer efficiency time: LED produced UVC remains effective at least 40.000 hours. The energy costs are minimal.
- LEDs are maintenance-free
- LEDs are safe for the environment. They do not contain environmental poisons (for example, mercury), and they are fully recyclable.
- UVC with LED is much more versatile: we can modulate the energy, the frequency, the power and the direction of the radiation with the unique control unit and materials, as well as liquids.
- UVC produced with LED is fast. The radiation starts immediately when the electricity is ON.
- LEDs are much smaller (3,5x3,5x1,2mm), handier and easier to install than conventional lamps.
- LEDs also withstand tremors and impacts.
- We can also control the wavelength with the control unit. The same device can have LEDs with different wavelengths.
- We can direct UVC radiation at the target more accurately. The conventional lamps radiate 360 degrees. In LFs devices, the direction of UVC radiation is aimed precisely at the right objects, materials, as well in liquids.



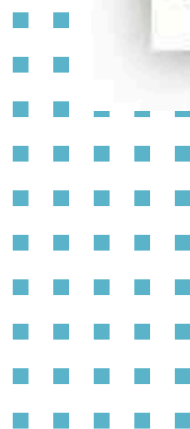


Medical Studies Data

DESTRUCTION OF GERMS

UVC-LED lights destroy 99.9% of the germs during each two-hour cycle. Here it's ensured that the number of microbes doesn't reach an alarming level at any point. For example, when disinfecting with conventional methods, microbes have up to 10 hours to increase before the next disinfection. In this time, for example, the population of bacteria *Clostridium botulinum* has time to change in the right conditions by 42.100.000.000 fold.

2019 Led Future Oy															
Bacterial growth under optimal conditions															
Bacteria	Division time min	Increase in bacterial count to 0-25 hours													
		0	1	2	3	4	5	6	7	8	9	10	15	20	25
<i>Escherichia coli</i>	20	1	8,0	64,0	512,0	4096,0	32768,0	262144,0	2097152	16777216	134217728	1,074E+09	3,518E+13	1,153E+18	3,778E+22
<i>Basillus</i>	20	1	8,0	64,0	512,0	4096,0	32768,0	262144,0	2097152	16777216	134217728	1,074E+09	3,518E+13	1,153E+18	3,778E+22
<i>Streptococcus pyogenes</i>	40	1	2,8	8,0	22,6	64,0	181,0	512,0	1448,1547	4096	11585,238	32768	5931641,6	1,074E+09	1,944E+11
<i>Clostridium botulinum</i>	17	1	11,5	133,3	1539,5	17776,0	205255,1	2370024,6	27366021	315987910	3,649E+09	4,213E+10	8,647E+15	1,775E+21	3,643E+26
<i>Clostridium difficile</i>	40	1	2,8	8,0	22,6	64,0	181,0	512,0	1448,2	4096,0	11585,2	32768,0	5931641,6	1,074E+09	1,944E+11
<i>Klebsiella pneumoniae</i>	38	1	3,0	8,9	26,7	79,7	238,0	711,0	2124,1	6345,8	18958,1	56637,6	13479004	3,208E+09	7,634E+11
<i>Haemophilus influenzae</i>	35	1	3,3	10,8	35,3	115,9	380,4	1248,3	4096,0	13440,4	44102,5	144715,2	55051774	2,094E+10	7,967E+12
<i>Bordetella pertussis</i>	138	1	1,4	1,8	2,5	3,3	4,5	6,1	8,2	11,1	15,1	20,4	91,9	414,6	1871,0
<i>Francisella tularensis</i>	300	1	1,1	1,3	1,5	1,7	2,0	2,3	2,6	3,0	3,5	4,0	8,0	16,0	32,0



LED Future Products

LF-DLS

Disinfecting double light: For efficient and fast alcohol-free disinfection and the illumination of premises and vehicles. The system includes UVC lights, regular LED lights and/or blue LED lights.

The LF-DLS is a unit placed inside the disinfection space that contains the control unit and the required number of double light units. The system consists of a display, a LED control unit and dual lights. The device also functions as a standard adjustable lamp.

The light of the UVC LED kills the microbes when directed to the surface.

The device detects motion inside the premises. The motion interrupts the UVC disinfection and it continues after a predetermined time after the movement is over. During the motion detection, the disinfection program can't be started.

The system includes wireless buttons outside the disinfection space. Those buttons are used to start the disinfection program and, when needed, to stop it during the disinfection cycle.

If the double light system has blue LEDs, the disinfection program is running when they are lit.



LED Future Products

LF-MLDS

DISINFECTION APPLIANCE FOR PASS-THROUGH CABINET

For disinfecting materials used in GMP clean rooms. The LF-MLDS's electronics and battery are placed either on top of the device or on the side. The device is capable of producing 100 two-minute disinfection cycles with one charge. (Battery 36 V, 10 Ah) The device comes with a Gen4-loD-32T mini-computer with a touch screen to change the disinfection time if necessary.

The number of disinfection cycles after the battery charge and the remaining time of the ongoing disinfection cycle are also displayed. All the other information is also visible on the touch screen.

The device can be started with a separate remote control, LF-MLDS App, or via a browser (the device has WIFI). LF-MLDS includes two magnetic safety switches to ensure the device doesn't start if the door of the pass-through cabinet is open.

The material to be disinfected is placed on a quartz glass plate in the device. Before the delivery of the device, disinfection tests are performed to the customer's materials. This helps to ensure the disinfection ability of the device.



LED Future Products

IQ MOBILE 80



VERY EFFICIENT AND ECOLOGICAL DISINFECTION SOLUTION FOR SMALL OBJECTS

The IQ MOBILE™ 80 disinfecting UV light is effective for all microbes: bacteria, viruses, fungi, molds, and protozoa – including pathogens and bacterial strains which are resistant to antibiotics. The IQ MOBILE™ 80 powerful UV-LED light also destroys the so-called "super bacteria". Within 2 minutes the device kills 99.9% of the microbes on the surface of the object.

Examples for disinfection: phones, keys, keyboards, remote controls, stethoscopes, or other sensitive objects, which are difficult to disinfect otherwise.



LED Future Innovation

Use in Aviation

Ventilation on Air: LED Future products fit into aeroplane ventilation systems. Invisible light disinfects moving air.

Lighting: Existing lighting systems in aeroplanes benefit from LF-DLS automated light that disinfects cabin, penetrating more difficult surfaces such as fabrics in seats. An easy, fast and superior method that kills 99.9% of the microbes.

On Air Facilities: Toilets and kitchen units. Automated systems that disinfect after each use. LED Future also has a product designed to purify water.

Airport: Conveyor belt, disinfecting luggage. Security & plastic containers in security. Escalator handrail disinfection.



LED Future Innovation

Public places, Airports, Malls & Hospitals

- Walk Through Chambers
- Airports
- Hospitals
- Malls (escalators, elevators)
- Supermarket & Agriculture Sector (With this technology the microbial level will drop, and the facilities within this sector will become germ-free and odourless)
- Education Sector (Kindergarten, Schools and Universities)
- Travel and Tourism Sectors (Airplanes, Cruise Ships, Hotels, Restaurants)
- Transportation Industry (Public Transport)
- Consumer Products - IQ Mobile (The possibility to disinfect anything, anywhere, anytime ie, mobile phones, TV remote, keys)



LED Future Products

LF-CIDD: LF-car indoor disinfection device

LF-CIDD - CAR INDOOR DISINFECTION DEVICE is a small dual unit that is installed inside the vehicle.

The device can be attached to the car hand grips. LF-CIDD will disinfect the cabin of the car in 10-12 minutes. This will prevent infection transmissions through the car especially at the car services, car washes or in taxis.



Thank you

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