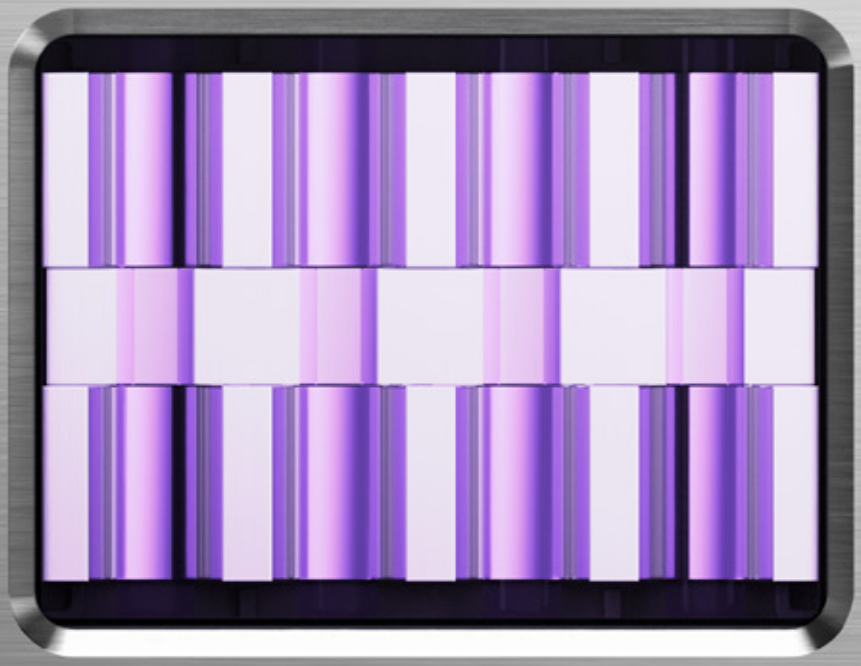
Nanovisio Oy

uvmedico



UV222 ™ Effective and safe disinfection for everyday life

UV Medico

Innovative solutions for a safer and healthier future

The wavelengths of Far UV-C rapidly inactivate SARS-CoV-2, the virus that causes COVID-19, as well as other common airborne and surface pathogens such as bacteria, mould, mites, spores, fungi, and even antibiotic-resistant superbacteria like MRSA.

In partnership with Ushio, developer and owner of the patented technology Care222, the UV222 lamp from UV Medico harnesses this game-changing technology and thus offers a highly effective solution for surface and air disinfection. The UV222 can be used in all spaces and is safe to use in presence of people.

UV222 is an essential tool to prevent the spread of existing and emerging viruses and other potential infections. The lamp is an answer to the challenges we face from COVID-19 as well as from similar threats in the future.

Care222 is a Far UV-C disinfection technology using 222 nm excimer lamps combined with an optical filter, which blocks wavelengths above 230 nm that can be potentially harmful to human skin and eyes.

Care222 is a trademark or registered trademark of Ushio Inc. and Ushio America Inc.

Facts about UV222™

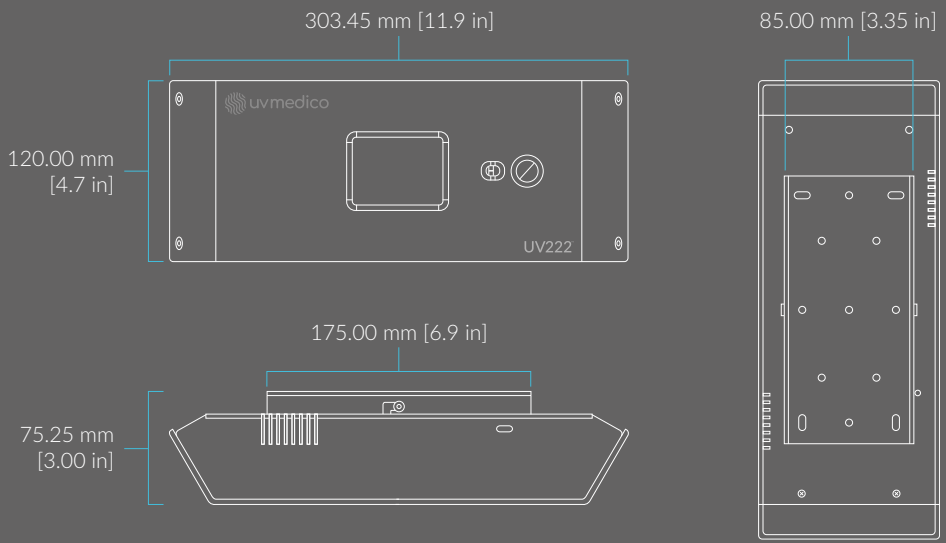
Safety	UV222 is 100% safe to use in presence of humans and animals, and fully complies with the international standards of UV radiation.
Efficacy	222nm is an effective disinfection method with immediate proven results. Research from across the world has proven 222 nm germicidal effect.
Knowledge	UV222 is developed and engineered in cooperation with several universities and is thoroughly tested and documented. UV222 can only be installed by authorised installers.
Ecological	Does not contain mercury. Disinfection without chemicals or residue.

UV222 specifications

Light source	Krypton chloride excimer lamp
Wavelength	222 nm
60° output	115 mW (Typical)
100° output	70 mW (Typical)
Input voltage	85-305V AC 50/60 Hz
Max power consumption	17 W
Mode	Continuous / duty cycle / motion activated
Weight	1.9 kg (4.19 lbs)
Dimensions	303.45 x 120.00 x 75.25 mm (11.9 x 4.7 x 3.0 in)
Power lead (PVC)	3 x 0.75 mm² (18 AWG)
Operating temperature	0° to +50° C (32° to 122° F)
Ambient humidity	5-90% RH Non condensing

Colours

Standard colour: White (RAL 9010 mat).
Custom colour on request.



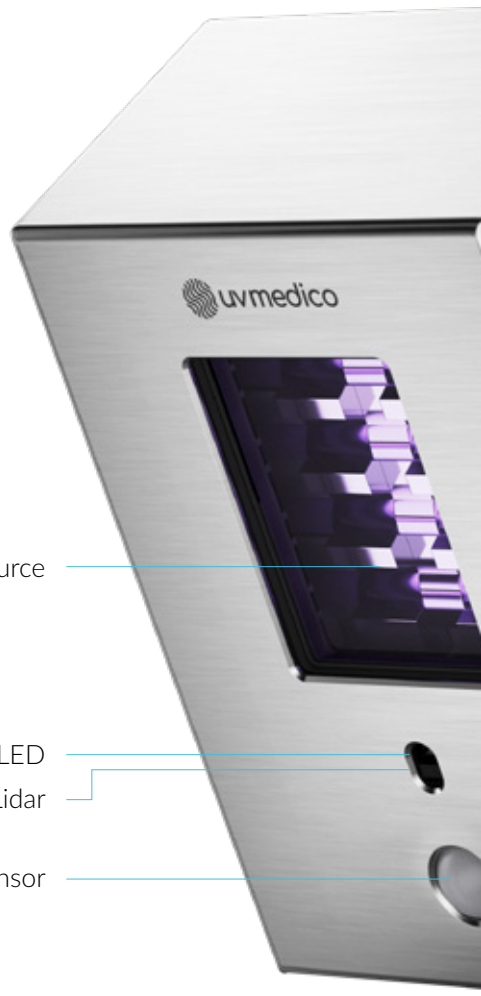
UV222 Vehicle

Ambulances and lifts

Small indoor spaces, such as vehicles and lifts, provide the right conditions to boost the spread of pathogens. To meet the increasing demands for higher hygiene, we have created UV222 Vehicle, to reduce the risk of infection in these areas.

UV222 Vehicle can be easily installed in ambulances, where fast and proper disinfection is essential for the transport of patients. The lamp will provide a continuous extra layer of disinfection without extending the cleaning process.

Lifts have also been appointed during the pandemic as sensitive areas for transmission of pathogens, and many are installed in buildings without proper ventilation systems. UV222 Vehicle can provide a disinfection as efficient as 35 air changes per hour.

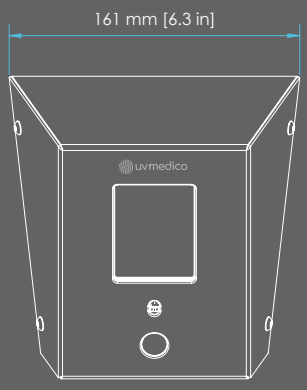


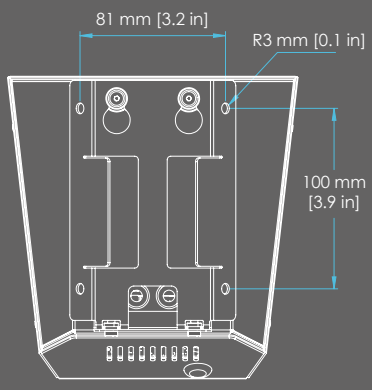
UV222 Vehicle specifications

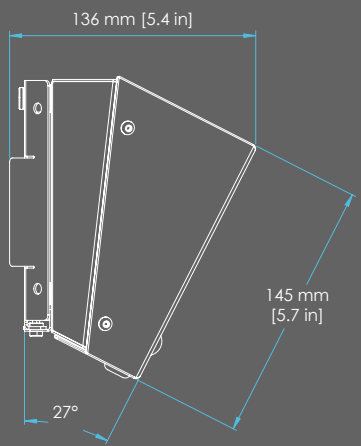
Light source	Krypton chloride excimer lamp
Wavelength	222 nm
60° output	115 mW (Typical)
100° output	70 mW (Typical)
Input voltage	9-32 V DC
Max power consumption	17 W
Mode	Continuous / duty cycle / motion activated
Weight	1.3 kg (2.86 lbs)
Dimensions	161 x 170 x 136 mm (6.30 x 6.70 x 5.4 in)
Power lead (PVC)	3 x 0.75 mm^2 (18 AWG)
Operating temperature	0° to + 50° C (32° to 122° F)
Ambient humidity	5-90% RH Non condensing

Colours

Standard colour:
Brushed aluminium.
Custom colour on request.





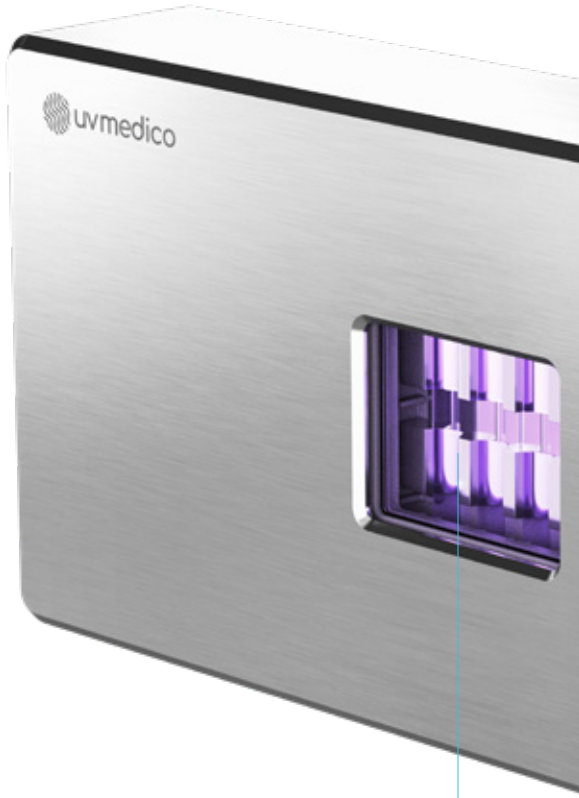


UV222 Industrial

For industry use

Ultraviolet light is widely used for disinfection in many industries, including medicine and food processing. The application of this technology in livestock production is a more recent development and is increasingly being used, especially on swine farms, as producers look for ways to improve biosecurity in response to frequent outbreaks of devastating diseases, such as African swine fever.

UV222 Industrial has been developed combining the benefits Far UV-C light and a housing adapted to the hardest environments. Thanks to its IP66 rating, UV222 Industrial is protected against pressurised water and designed to stand extreme temperatures, which makes it ideal for the disinfection of production areas, barns, and stables for the protection of living animals, offering continuous disinfection with a harmless radiation.



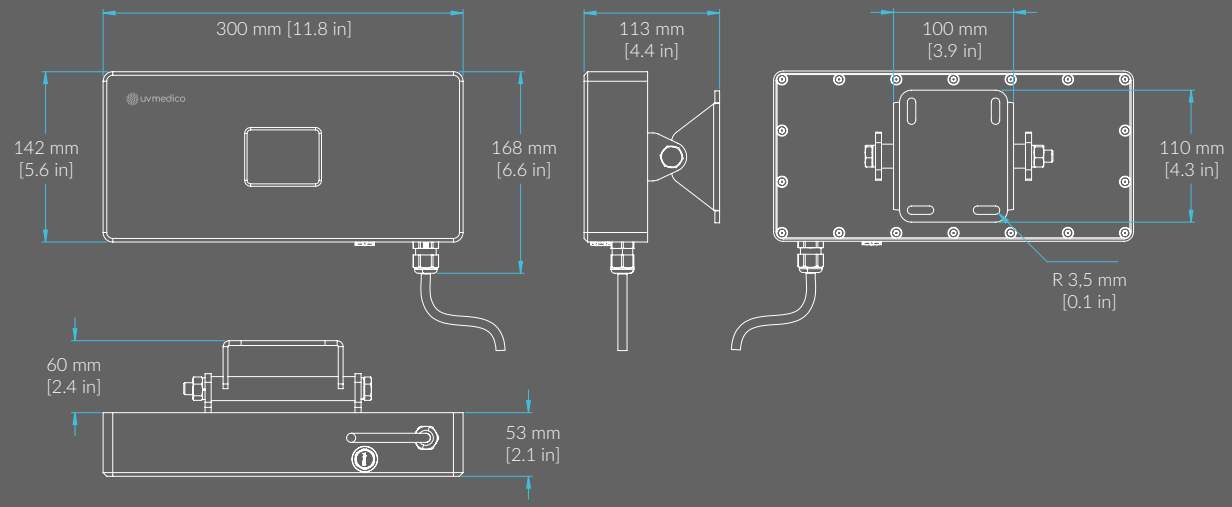
Filtered Far UV-C light source

UV222 Industrial specifications

Light source	Krypton chloride excimer lamp
Wavelength	222 nm
60° output	115 mW (Typical)
100° output	70 mW (Typical)
Input voltage	85-305V AC 50/60 Hz
Max power consumption	17 W
Mode	Continuous / duty cycle
Weight	3 kg (6.6 lbs)
Dimensions	300 x 168 x 113 mm (11.8 x 6.6 x 4.4 in)
Power lead (rubber)	3 x 0.75 mm^2 (18 AWG)
Ambient temperature	-10° to + 50° C (14° to 122° F)
Ambient humidity	5-90% RH

Colours

Standard colour:
Brushed aluminium.
Custom colour on request.

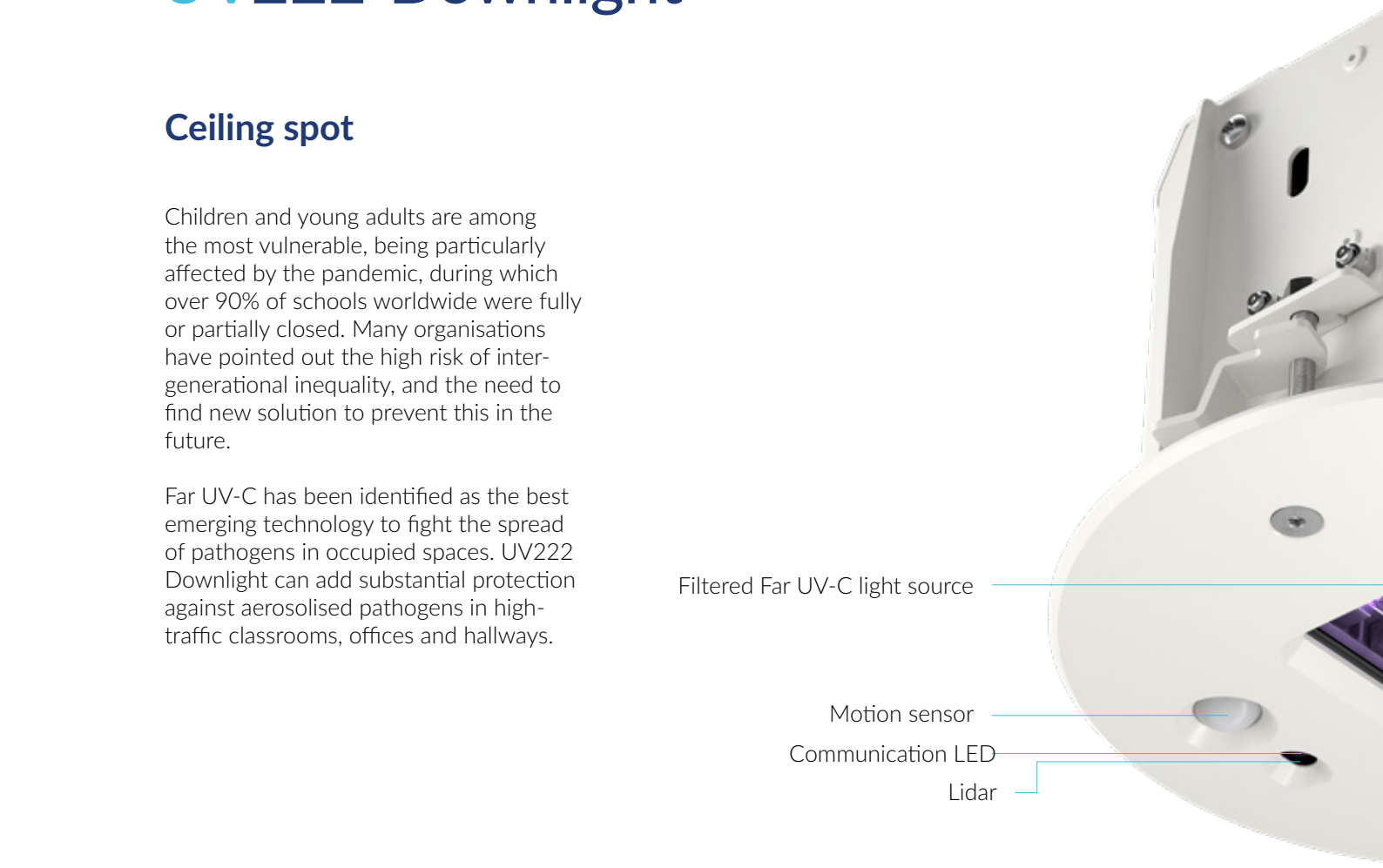


UV222 Downlight

Ceiling spot

Children and young adults are among the most vulnerable, being particularly affected by the pandemic, during which over 90% of schools worldwide were fully or partially closed. Many organisations have pointed out the high risk of inter-generational inequality, and the need to find new solution to prevent this in the future.

Far UV-C has been identified as the best emerging technology to fight the spread of pathogens in occupied spaces. UV222 Downlight can add substantial protection against aerosolised pathogens in high-traffic classrooms, offices and hallways.

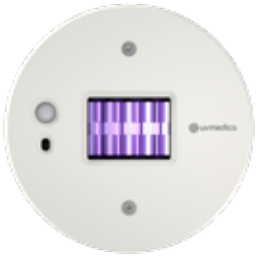


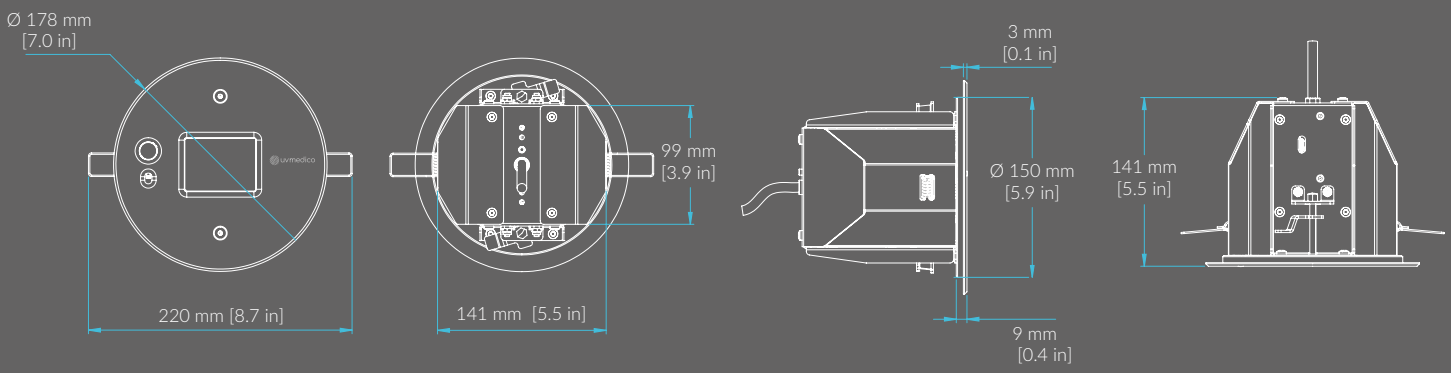
UV222 Downlight specifications

Light source	Krypton chloride excimer lamp
Wavelength	222 nm
60° output	115 mW (Typical)
100° output	70 mW (Typical)
Input voltage	85-305V AC 50/60 Hz
Max power consumption	17 W
Mode	Continuous / duty cycle / motion activated
Weight	1.6 kg (3.5 lbs)
Dimensions	Ø 178 mm x 129 mm (Ø 7 in x 5 in)
Power lead (PVC)	3 x 0.75 mm² (18 AWG)
Operating temperature	0° to + 50° C (32° to 122° F)
Ambient humidity	5-90% RH Non condensing

Colours

Standard colour:
White (RAL 9010 mat).
Custom coulour on request.





UV222 Pendant

Adjustable height

The hospitality sector presents a special challenge in the prevention of the spread of viruses and bacteria, due to frequent gathering of customers in closed spaces. It only requires a diseased individual to release into the atmosphere the potentially infectious pathogen, that will then be carried all over the room.

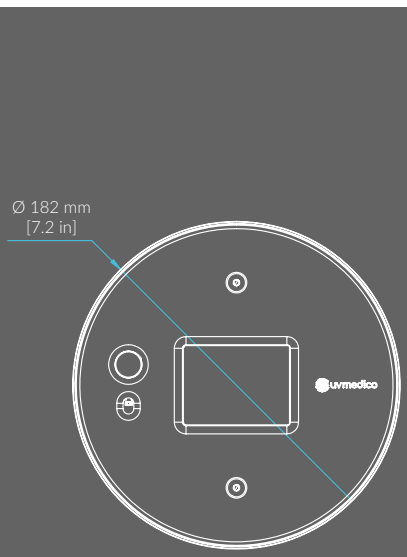
Transmission of bacteria can take place also via surfaces. Tables, chairs, and menus are among the most typical places to find bacteria agglomerations. UV222 Pendant targets the disinfection of air and surfaces in the hospitality industry to protect customers and employees. Deeper and safer disinfection made possible, with an elegant design easily integrated into any space.

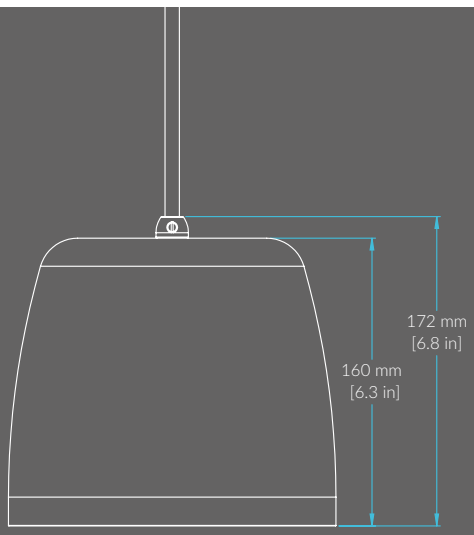
UV222 Pendant specifications

Light source	Krypton chloride excimer lamp
Wavelength	222 nm
60° output	115 mW (Typical)
100° output	70 mW (Typical)
Input voltage	85-305V AC 50/60 Hz
Max power consumption	17 W
Mode	Continuous / duty cycle / motion activated
Weight	2.3 kg (4.48 lbs)
Dimensions	Ø 182 mm x 172 mm (7.2 in x 6.8 in)
Power lead (nylon)	3 x 0.75 mm² (18 AWG)
Ambient temperature	0° to + 50° C (32° to 122° F)
Ambient humidity	5-90% RH (Non condensing)

Colours

Standard colour:
White (RAL 9010 mat).
Custom colour on request.





Case Café Dan Turèll

Serving in safe surroundings

Café Dan Turèll became the first restaurant in Copenhagen to install our human-safe far-UVC lamp, UV222, for continuous and efficient disinfection of the air and surfaces.

The preliminary results from Café Dan Turèll showed that it was possible to inactivate more than 99% of bacteria - matching previous results on viruses such as SARS-CoV-2.

This significantly reduces the spread of infectious diseases and provides safe surroundings for both customers and staff.

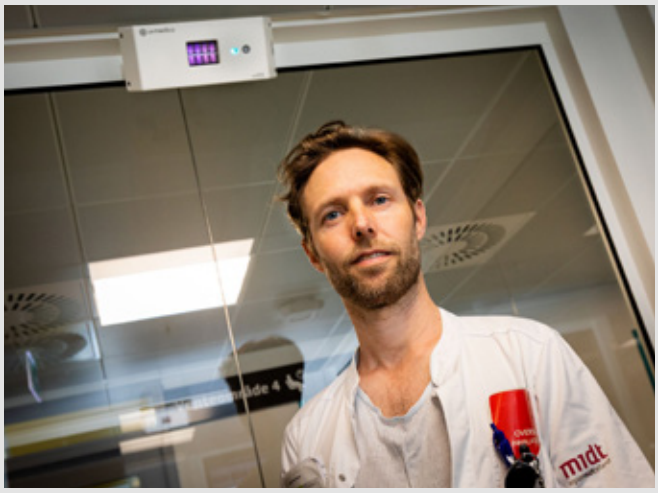
The UV222 is delivered in a custom yellow, ensuring a perfect match to the iconic styling in Café Dan Turèll.

Case Aarhus University Hospital

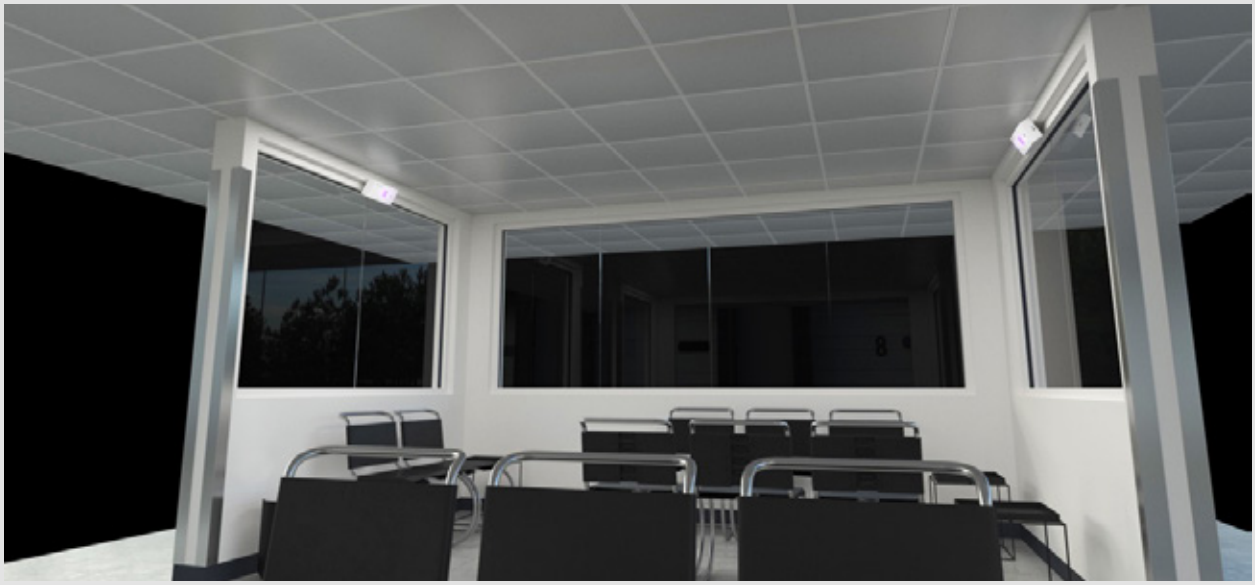
Protecting vulnerable patients

Our lamps are installed in the waiting area of the Department of Respiratory Diseases and Allergy at Aarhus University Hospital (AUH), for the protection of vulnerable patients.

In a joint effort between Aarhus University and AUH, disinfection of surfaces in the area has been tested. Results show that UV222 exposure significantly reduces the overall bacterial load and eliminates pathological bacterial species in this out-patient clinic daily.



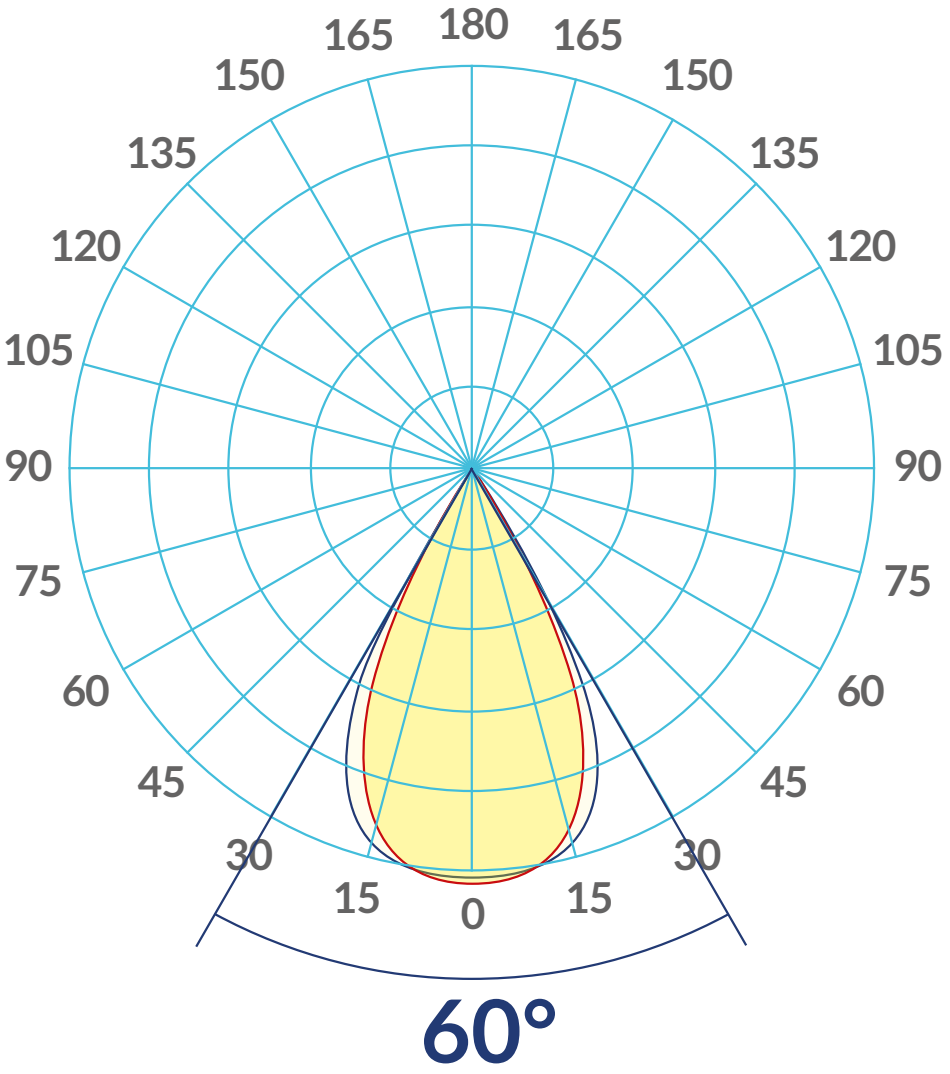
Søren Helbo, Ward Doctor at the Lung Clinic in Aarhus University Hospital.



Facts about waiting area

Dimensions	W: 3 m x L: 3 m x H: 2.8 m (9’ 11” x 9’ 11” x 9’ 2”)
Area	9 m^2 (97 ft^2) - 8 persons
Inventory	8 chairs
Number of UV222™	2

60° beam angle

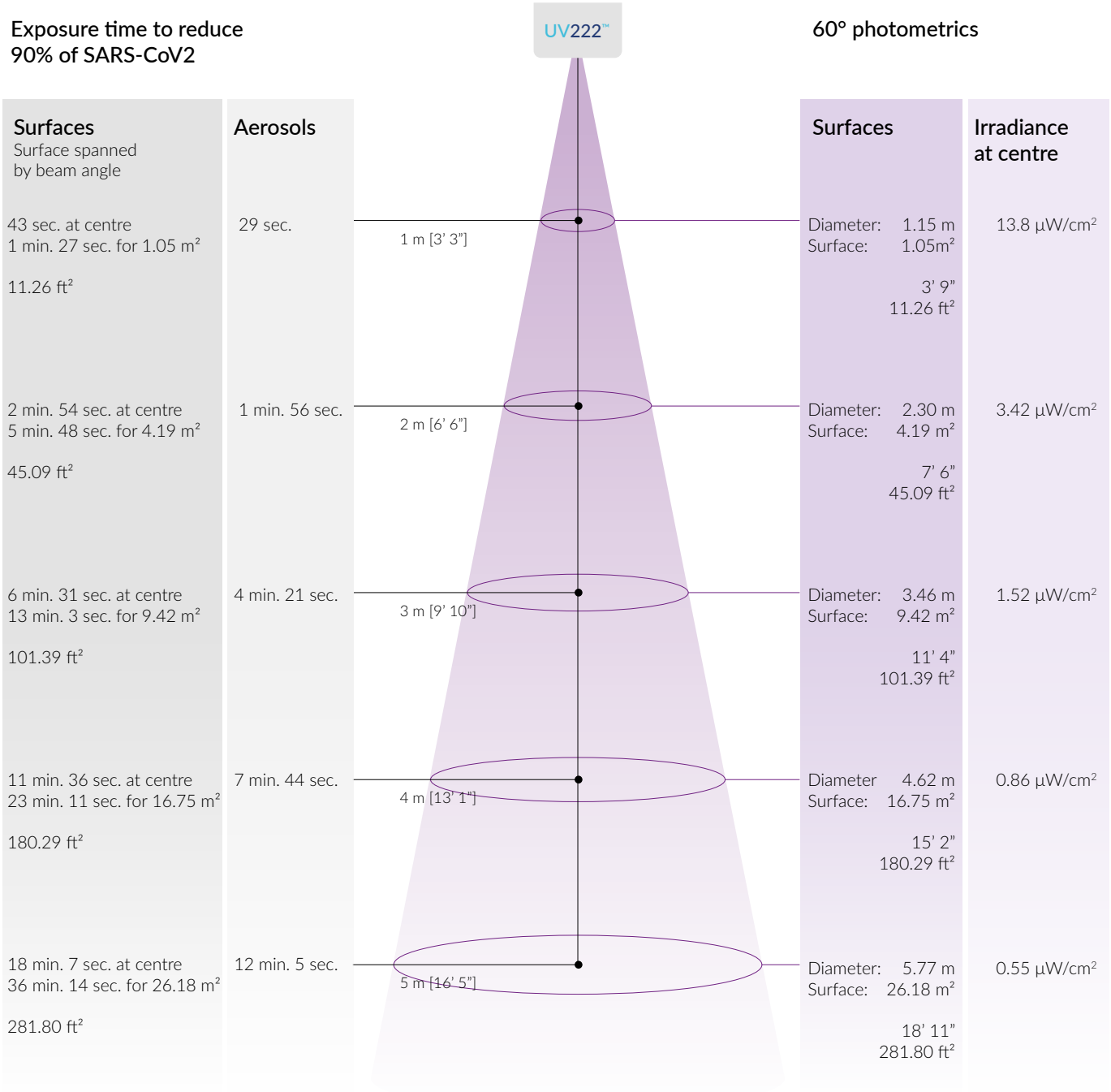


Light measurement results

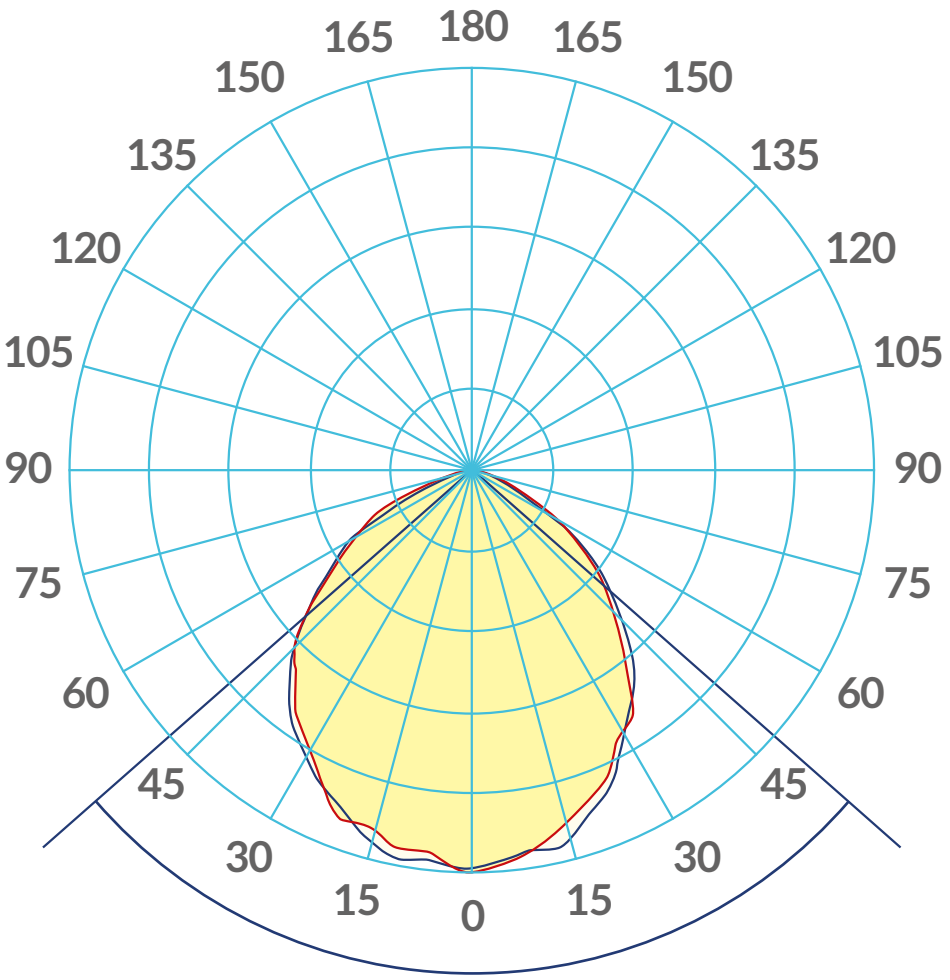
Output - total optical power flux, 200 nm - 850 nm	126.92	mW
Far UV-C 200 nm - 230 nm	120.79	mW
VIS-IR: 400 nm - 850 nm	6.81	mW
Radiated power/lamp power	0.926	%
Peak emission wavelength	222	nm
UV (222 nm) irradiance at centre at 1 m (3’ 10”)	13.8	µW/cm^2
Beam angle	60	°

Exposure time with 60° UV222 - SARS-CoV2/COVID-19

Peak emission wavelength	222 nm
Output power in range (200-230 nm)	115 mW
Dose needed (222 nm, COVID-19) 90% inactivation for aerosols	390 µJ/cm²
Dose needed (222 nm, COVID-19) 90% inactivation for surfaces	600 µJ/cm²



100° beam angle

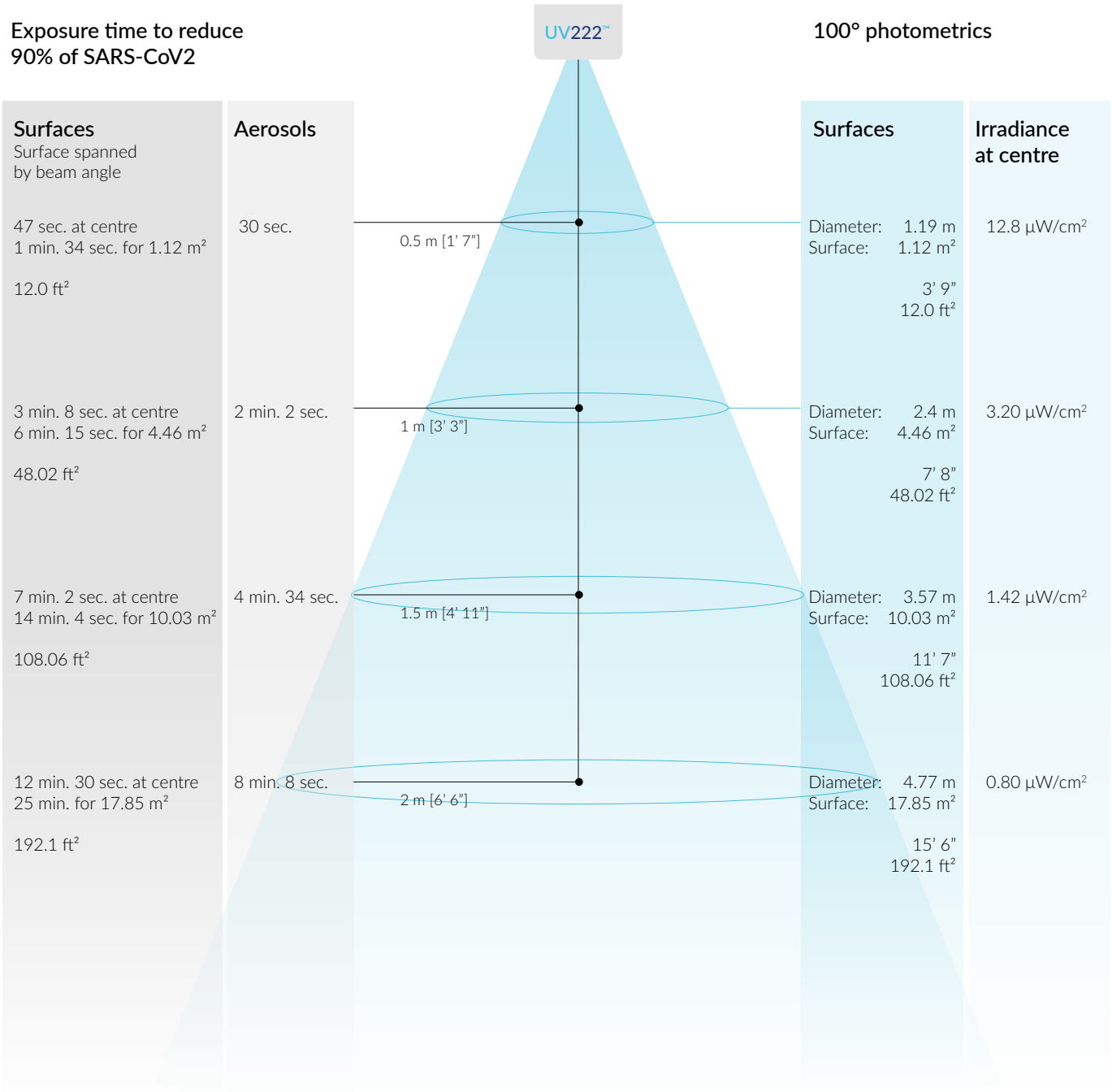


Light measurement results

Output - total optical power flux, 200 nm - 850 nm	75.72	mW
Far UV-C 200 nm - 230 nm	58.79	mW
VIS-IR: 400 nm - 850 nm	10.71	mW
Radiated power/lamp power	0.57	%
Peak emission wavelength	222	nm
UV (222 nm) irradiance at centre at 1 m (3’ 10”)	3.2	µW/cm^2
Beam angle	100	°

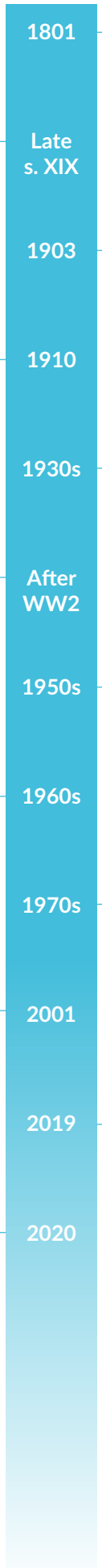
Exposure time with 100° UV222 - SARS-CoV2/COVID-19

Peak emission wavelength	222 nm
Output power in range (200-230 nm)	70 mW
Dose needed (222 nm, COVID-19) 90% inactivation for aerosols	390 µJ/cm²
Dose needed (222 nm, COVID-19) 90% inactivation for surfaces	600 µJ/cm²



History of UV-C light

Read about how UV-C light has been a part of our lives for over 100 years



1801

Discovery of UV radiation
The German physicist Johann Wilhelm Ritter discovers UV radiation.

Late s. XIX

IAQ treatment
UV-C is used to kill microorganisms that typically cause problems with indoor air quality (IAQ).

1903

Nobel Prize
Niels Finsen, Danish-Faroese physician and scientist, wins the Nobel Prize in Medicine for his research on UV-C treatment of lupus vulgaris, also known as tuberculosis of the skin.

1910

First water treatment installation
UV-C is used to disinfect the water supply in Marseille, France.

1930s

First UV-C germicidal lamps
During the 1930s, Westinghouse developed the first commercial UV-C germicidal lamps, used primarily in hospitals.

After WW2

Installations for air sterilisation
Different spaces and facilities like hospitals, breweries, meat storage and processing plants, dairies, and kitchens; use UV-C to control the threat of microbiological contamination.

1950s

Fight against tuberculosis
UV-C is incorporated into air handling equipment and becomes a major help in the control and defeat of tuberculosis.

1960s

Greater safety
The introduction and growing availability of new drugs and sterilising cleaners, decrease the concern about pathogens.

1970s

Energy crisis
To save energy, heating, ventilation and air conditioning systems were shut down. Condensation accumulated in the systems, and mould and other microbial contaminants multiplied in the dark, damp environment, being released once the systems were turned on again.

2001

Widespread use for water treatment
By 2001, over 6,000 UV water treatment plants using UV-C light are operating in Europe.

2019

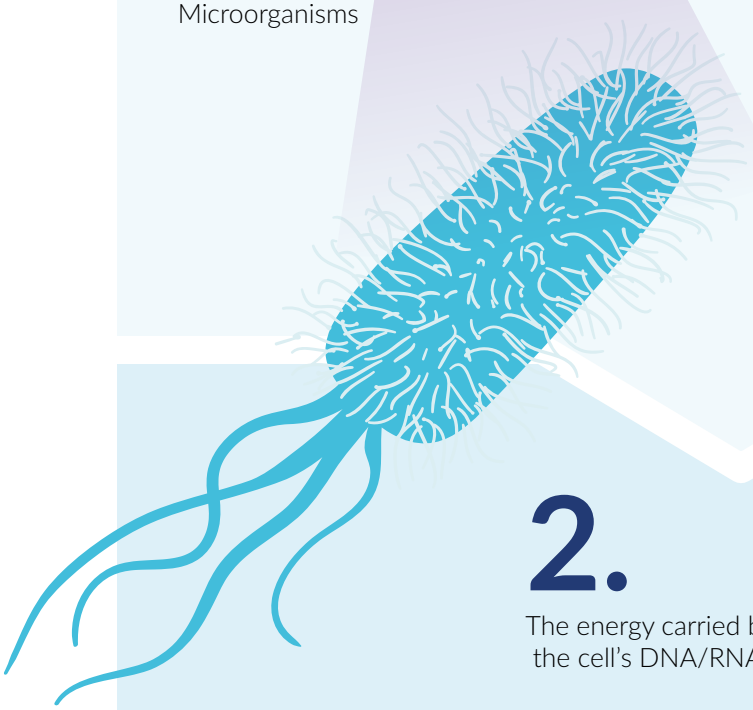
COVID-19 pandemic
The SARS-CoV2 virus causes a global lockdown, bringing the world to a halt. Different products using UV-C and Far UV-C light appear on the market, bringing disinfection into small businesses and private homes.

2020

UV Medico
The Danish company UV Medico is founded, focusing on the use of human-safe Far UV-C light at 222 nm.

How Far UV-C light inactivates pathogens

Microorganisms



1.

Energy from the Far UV-C 222 nm wavelength destroys surface proteins and penetrates the cell wall.

2.

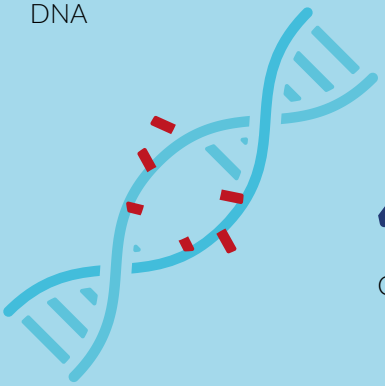
The energy carried by Far UV-C damages the cell's DNA/RNA in multiple ways.

DNA

3.

The DNA/RNA damage inactivates the micro-organism, preventing it from replicating and infecting.

DNA



4.

Cells that cannot replicate or infect will die shortly after.

Time to inactivate 90% of microorganisms[1]

Distance 50 cm (1' 7")				
Bacteria	Medium	Dose for 90% reduction[2]	60°, time [min]	100°, time [min]
Arthrobacter nicotinoverans	L	5.67	2	11
Bacillis subtilis	L	4.09	1	8
Clostridium sporogenes	L	2.87	1	6
Deinococcus radiodurans	L	29.65	9	59
Enterococcus faecalis	L	9.14	3	18
Enterococcus faecalis	S	7.59	2	15
Escherichia coli	L	2.1	1	9
Listeria monocytogenes	L	3.58	1	7
Pseudomonas aeruginosa	L	1.98	1	4
Salmonella Typhimurium	L	1.97	1	4
Staphylococcus aureus	S	4.69	1	9
Staphylococcus aureus	L	3.24	1	6
Streptococcus pyogenes	L	20.91	6	42
Yersinia enterocolytica	L	2.2	1	4

Bacterial spores	Medium	Dose for 90% reduction[2]	60°, time [min]	100°, time [min]
Alicyclobacillus acidoterrestris spores	L	6.02	2	12
Bacillus cereus spores	L	17.88	5	36
Bacillus pumilus spores	L	18.79	6	37
Bacillus pumilus spores	S	8.52	3	17
Bacillus subtilis spores	S	0.89	0.3	2
Bacillus subtilis spores	L	6.34	2	12
Bacillus thuringiensis spores	L	10.73	3	21
Chlostridium pasteurianum spores	L	2.63	1	5
Clostridioides difficile spores	L	13.23	4	26
Clostridioides difficile spores	S	16.67	5	33
Clostridioides sporogenes spores	L	10.37	3	21
Streptomyces griseus spores	S	14.38	4	29
Streptomyces griseus spores	L	6.67	2	13
Thermoactinomyces vulgaris spores	L	15.14	5	30

A Air (aerosols)
L Liquid, typically water
S Solid

[1] Hessling M. The impact of far-UVC radiation (200-230 nm) on pathogens, cells, skin, and eyes - a collection and analysis of a hundred years of data. GMS Hyg Infect Control. 2021 Feb 16;16:Doc07.

[2] Units are in mJ/cm²

Distance 50 cm (1’ 7”)				
Fungi	Medium	Dose for 90% reduction[2]	60°, time [min]	100°, time [min]
Aspergillus niger spores	L	106.82	32	213
Candida albicans	L	9.82	3	20
Penicillium expansum spores	L	13.82	4	28
Saccharomyces cerevisiae	S	12.77	4	25
Saccharomyces cerevisiae	L	22.33	7	44
Trichophyton rubrum spores	L	13.64	4	27

Viruses	Medium	Dose for 90% reduction[2]	60°, time [min]	100°, time [min]
Adenovirus	L	5.09	2	10
Bacillus megatherium phage	S	4.79	2	10
Encephalomyocarditis virus	L	4.71	1	9
Feline calcivirus	L	9.57	3	19
Herpes simplex virus	L	0.96	0.3	2
Human coronavirus	A	0.48	0.1	1
Influenza virus	A	1.28	0.4	3
Phage MS2	L	8.35	3	17
Phage PhiX174	L	1.84	1	4
Phage Qbeta	L	5.12	2	10
Phage T1UV	L	2.84	1	6
Phage T2	L	3.36	1	6.7
Phage T7	L	1.72	0.5	3
Reovirus 3	L	3.3	1	7
Rotavirus	L	4.55	1	9
SARS-CoV-2	S	1.2	0.5	2
Tulane virus	L	5.56	2	11
Vaccinia virus	L	6.53	2	13
Vesicular stomatitis virus	L	1.12	0.3	2

Protozoa	Medium	Dose for 90% reduction[2]	60°, time [min]	100°, time [min]
Cryptosporidium parvum	L	2.5	1	5

Why is UV222™ safe?

- Thanks to the patented and unique filter technology Care222, UV222 emits at a narrow UV spectrum safe for human exposure.
- UV222 complies with the UL867 regulation on maximum concentration of ozone generation.

UV222 does not emit harmful wavelengths.

In compliance with

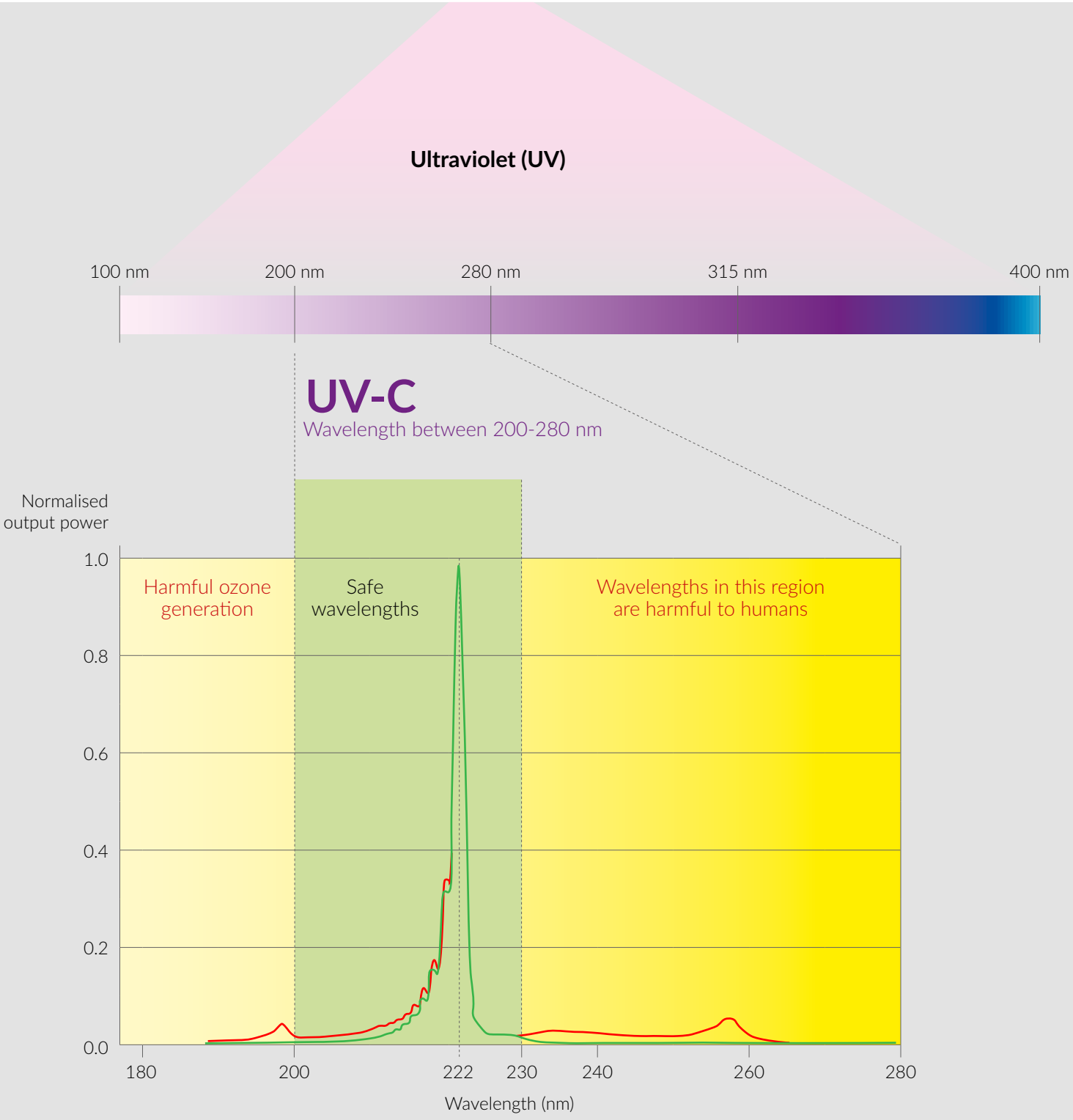
International Standard:

ISO 15858	UV-C Devices – Safety information – permissible human exposure.
IEC 62471	Photobiological safety of lamps and lamp systems.
IEC PAS 63313 ED1	Position statement on germicidal UV-C irradiation – UV-C safety guidelines (see Global Lighting Association).

International Guidelines:

ACGIH® (American Conference of Governmental Industrial Hygienists)	2021 TLV (Threshold Limit Values) & BEI (Biological Exposure Indices) for chemical substances and physical agents.

WARNING!
Unfiltered Far UV-C can cause cancer and may increase the risk of cataracts!



UV222 Far UV-C excimer lamp **with** an optical band-pass filter
A typical krypton-chloride excimer lamp **without** an optical band-pass filter

Exposure to harmful wavelengths is eliminated by an exclusive, patented optical band-pass filter.

uvmedico

Yhteystiedot

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