

PHILIPS

UV-C disinfection desk lamp



Philips UV-C disinfection desk lamp Commercial Release

Sep 2020



Bacteria, virus is everywhere at home



Chronic disease

Disinfection to reduce pathogenic bacteria



Children

Low resistance requires frequent disinfection

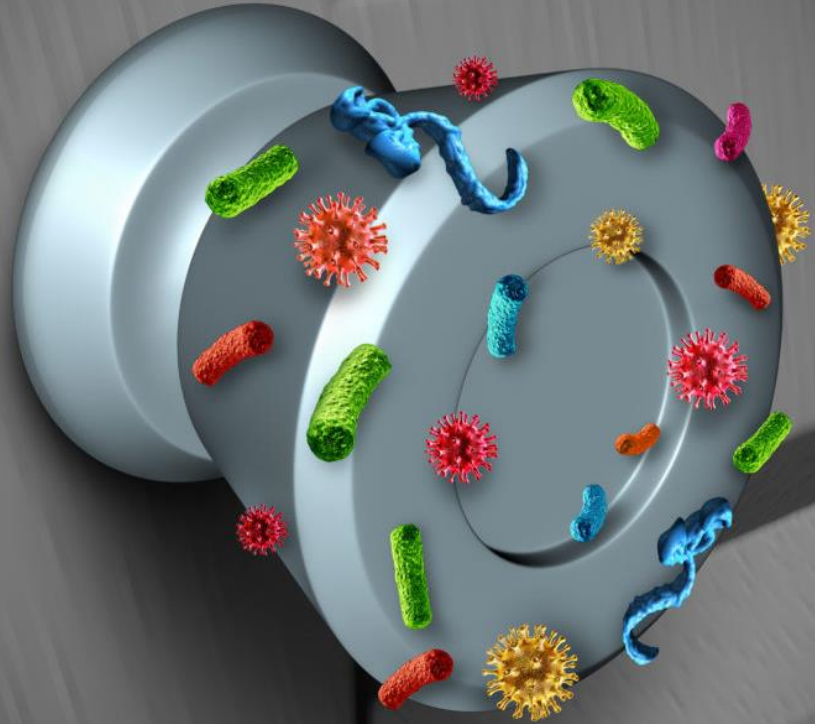
Clean home and protect your family



Pets

Regular disinfection to avoid virus/bacteria transmission between human and animal

Bacteria and viruses are present in the air, on food, plants and animals, in soil and water — and on just about every other surface...



Some everyday encounters with germs

- **Traditional grocery store shopping carts** have 361 times more bacteria than a bathroom doorknob.
- **Supermarket fridge doors** have 1,235 times more bacteria than the surface of your cell phone.
- **50% of self-checkout touchscreens** sampled had fecal bacteria on them.



Source : Reusethisbag.com, an online retailer for reusable shopping bags, released the results of a study in which they surveyed the bacteria levels at more than 100 grocery stores of varying sizes and price levels in 10 states across America. The survey covered New York, California, Texas, Florida, and Maine.



That's why
disinfecting air and surfaces
is important for our health & well-being

UV-C light

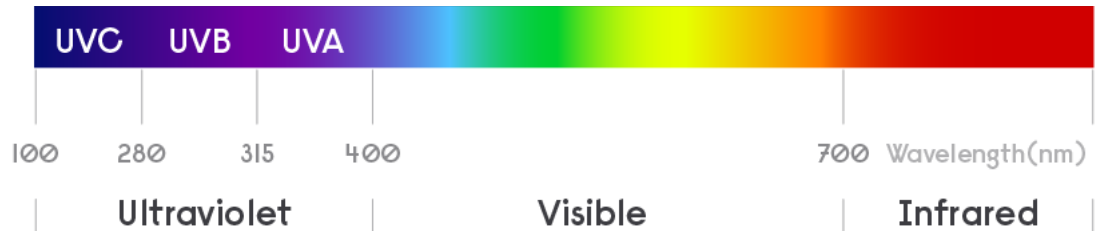
has the power to disinfect

What is UV-C and how does it work?

What is UV radiation?

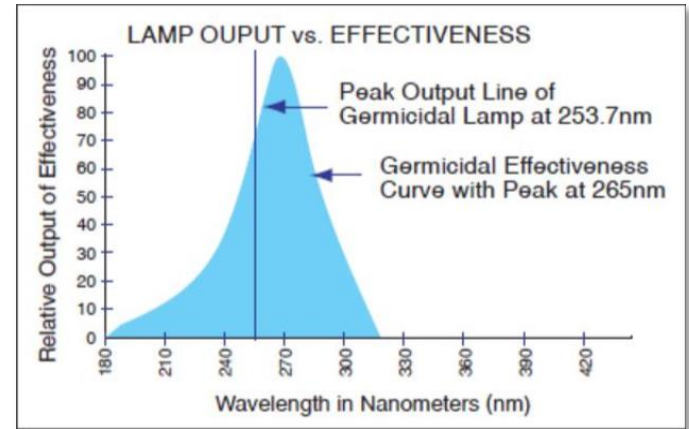
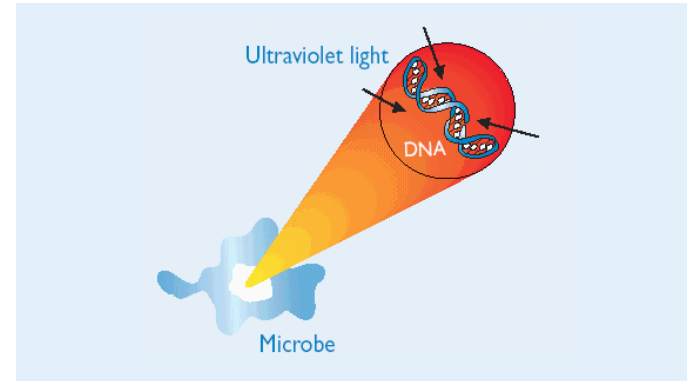
Ultraviolet (UV) light is invisible to human eyes. It can be subdivided into three categories:

UV-C from 200 to 280 nm	UV-B from 280 to 315 nm	UV-A from 315 to 400 nm
<ul style="list-style-type: none">For disinfection purposes and germicidal application	<ul style="list-style-type: none">For medical use (i.e. phototherapy to treat skin conditions, including psoriasis)	<ul style="list-style-type: none">For use with curing, tanning and insect traps.



How does it work?

- UV-C radiation can **break the DNA and RNA** of bacteria, viruses and spores, meaning that they leave them harmless. There are **no known micro-organisms resistant** to UVC.¹
- UV-C technology has been used **safely and effectively** in hospitals and governmental buildings for more than **40 years**²
- Most UV-C solutions **utilize conventional lighting**, with LED now improving in efficiency
- The **peak output of our germicidal lamps (253.7nm)** is close (80-85%) to the maximum effectiveness of UV-C (265nm)
- Smaller UV-C wavelengths (222nm) are being explored as less harmful alternatives



¹Fluence (UV Dose) Required to Achieve Incremental Log Inactivation of Bacteria, Protozoa, Viruses and Algae Revised, updated and expanded by Adel Haji Malayeri, Madjid Mohseni, Bill Cairns and James R. Bolton. With earlier contributions by Gabriel Chevrefils (2006) and Eric Caron (2006) With peer review by Benoit Barbeau, Harold Wright (1999) and Karl G. Linden

²EPA Report, "Building Retrofits for Increased Protection Against Airborne Chemical and Biological Releases" Pg. 56

The dose & time required to eliminate the targeted pathogens

The correct dose is based on intensity and time:

$$\text{Irradiance} \left[\frac{W}{m^2} \right] \times \text{Time} [S] = \text{UV dose} \left[\frac{J}{m^2} \right]$$

UV dose to obtain 90% killing rate	Dose	k
Bacteria		
Bacillus anthracis	45.2	0.051
B. megatherium sp. (spores)	27.3	0.084
B. megatherium sp. (veg.)	13.0	0.178
B. paratyphosus	32.0	0.072
B. subtilis	71.0	0.032
B. subtilis spores	120.0	0.019
Campylobacter jejuni	11.0	0.209
Clostridium tetani	120.0	0.019
Corynebacterium diptheriae	33.7	0.069
Dysentery bacilli	22.0	0.105
Eberthella typhosa	21.4	0.108
Escherichia coli	30.0	0.077
Klebsiella terrifani	26.0	0.089
Legionella pneumophila	9.0	0.256
Micrococcus candidus	60.5	0.038
Micrococcus sphaeroides	100.0	0.023
Mycobacterium tuberculosis	60.0	0.038
Neisseria catarrhalis	44.0	0.053
Phytomonas tumefaciens	44.0	0.053
Pseudomonas aeruginosa	55.0	0.042
Pseudomonas fluorescens	35.0	0.065
Proteus vulgaris	26.4	0.086
Salmonella enteritidis	40.0	0.058
Salmonella paratyphi	32.0	0.072
Salmonella typhimurium	80.0	0.029
Sarcina lutea	197.0	0.012
Serratia marcescens	24.2	0.095
Shigella paradysenteriae	16.3	0.141
Shigella sonnei	30.0	0.077
Spirillum rubrum	44.0	0.053
Staphylococcus albus	18.4	0.126
Staphylococcus aureus	26.0	0.086
Streptococcus faecalis	44.0	0.052
Streptococcus hemolyticus	21.6	0.106
Streptococcus lactus	61.5	0.037
Streptococcus viridans	20.0	0.115
Sentertidis	40.0	0.057
Vibrio cholerae (V.comma)	35.0	0.066
Yersinia enterocolitica	11.0	0.209

UV dose to obtain 90% killing rate	Dose	k
Yeasts		
Bakers' yeast	39	0.060
Brewers' yeast	33	0.070
Common yeast cake	60	0.038
Saccharomyces cerevisiae	60	0.038
Saccharomyces ellipsoideus	60	0.038
Saccharomyces sp.	80	0.029

UV dose to obtain 90% killing rate	Dose	k
Mould spores		
Aspergillus flavus	600	0.003
Aspergillus glaucus	440	0.004
Aspergillus niger	1320	0.0014
Mucor racemosus A	170	0.013
Mucor racemosus B	170	0.013
Oospora lactis	50	0.046
Penicillium digitatum	440	0.004
Penicillium expansum	130	0.018
Penicillium roqueforti	130	0.018
Rhizopus nigricans	1110	0.002

UV dose to obtain 90% killing rate	Dose	k
Virus		
Hepatitis A	73	0.032
Influenza virus	36	0.064
MS-2 Coliphase	186	0.012
Polio virus	58	0.040
Rotavirus	81	0.028

UV dose to obtain 90% killing rate	Dose	k
Protozoa		
Cryptosporidium parvum	25	0.092
Giardia lamblia	11	0.209

UV dose to obtain 90% killing rate	Dose	k
Algae		
Blue Green	3000	0.0008
Chlorella vulgaris	120	0.019

A modern living room with a grey sectional sofa, a coffee table, and a chair. A Philips UV-C disinfection desk lamp is on the coffee table. The room features light wood flooring, a white shag rug, and a wooden sideboard with books. Large windows with sheer and heavy curtains are in the background.

Home Disinfection Application

Value proposition



Value proposition: Home Disinfection

Target

Homeowners, 25-50, caring about the health of their family and particularly concerned about the recent Covid-19 related events.

Benefit

Philips UV-C lights can effectively inactivate virus, bacteria and spores, in a matter of minutes. There are no known micro-organisms resistant to UV-C, including Covid-19.

Knowing that the UV-C exposition can be harmful to eyes and skin, the Philips products are designed for maximum safety, with an intuitive panel and the usage of motion sensors and timers

It is simple to use, with a concise control panel and voice support.

Insight

"I am concerned about the exposition of my family to virus and bacteria, specially after this pandemics. I want to do everything that I can to protect my home, but it should be safe and easy to use"

Alternatives

- Competitors with less safe solutions (some of them not even inform about the risks)
- Competitors are less efficient (even when the Philips tube is used)
- Competitors that are not easy to use (which also increase safety risk).

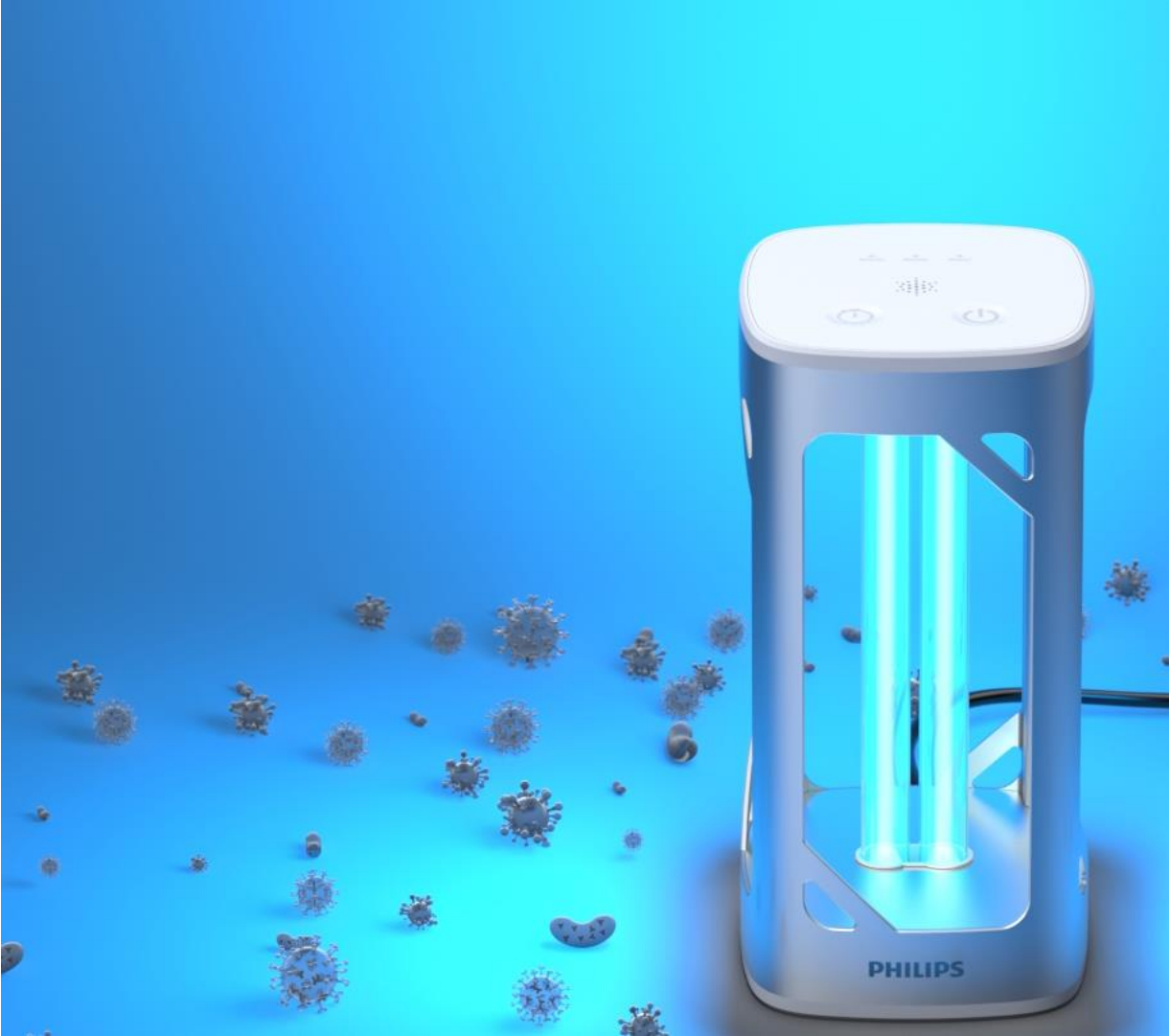
Reasons to Believe

1. No known pathogen resistant to UVC, including Covid-19
2. Disinfects surfaces and objects in a matter of minutes
3. UVC technology has been used safely and effectively in hospitals and governmental buildings for more than 40 years
4. Sensors, timers and an intuitive panel provide extra safety
5. Simple to use

Superiority

- Designed for maximum safety
- 35+ years experience in UV-C lighting and strong application expertise.
- Dedicated driver design to maximize the tube output
- Strictly follow Signify UV-C SAFETY GUIDE & SAFETY BOARD review

Our offering



UVC disinfection desk lamp

Specification

- Wattage: 24W
- UVC light power: 6W
- Input voltage: 220-240V
- Weight: 800 g
- Lifetime 9000hrs
- Voice support: EN
- Power wire 2.9m



Silver



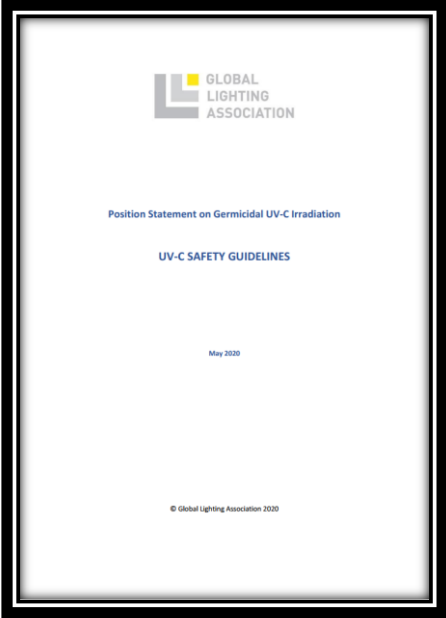
Rose gold

Bar Code	12NC		Power (W)	Lifetime	List Price (RM)	Remarks
8719514286108	929002473107	NEW UVC disinfection desk lamp S HK/SG/MY	24W	9000	499.00	Silver
8719514286122	929002472407	NEW UVC disinfection desk lamp P HK/SG/ MY	24W	9000	499.00	Rose Gold

UVC product safety regulation

CE requirements	Standard/guidelines
Safety	IEC 60598
EMC	EN 55015/EN 61547/EN 61000-3-3/EN 61000-3-2
ROHS	EN 50581
RED (RF)	EN 300 440/EN 301489-1/EN 301489-3
UVC Evaluation	GLA guideline including below : IEC 62471 UV Radiation , Sensor, warning etc.

- There is no released IEC standard about safety for UVC product, so it doesn't mean it's safe product with CE mark in EU market.
- Global lighting association released a design guideline to make sure UVC product is safety in May 2020.
- Our product will be 1st one to follow and meet all requirements from UVC safety guideline in EU market.



Global lighting association release UVC safety guidelines in May 2020



Step-by-step
voice guidance



Intuitive
control



Safety
sensor



Built-in
timer



Product Feature

Safety sensor

Built-in timer

Step-by-step voice guidance

Intuitive control



Feature

Safety sensor

Built-in timer

Step-by-step voice guidance

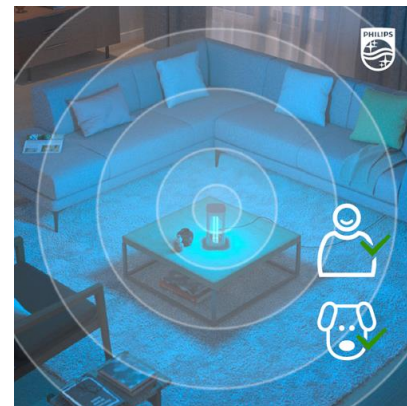
Intuitive control

Safety sensor is one of active safety strategy to avoid UVC exposure for humans and animals, it can detect small movement from humans and animals within sensor detection range, then keep stand-by during the start stage or shut down UVC immediately during disinfection stage.

- Select high quality and reliable microwave sensor
- Sensor detection range is 5m radius*
- Sensor self check after power on, make sure sensor is active during the whole process.

Safety sensor

As UV-C exposure can be harmful to eyes and skin, the built-in safety sensor detects movement from humans and animals, immediately locking the product



*it's still safe under $30\text{mJ}/\text{cm}^2$ UVC light according to GLA UVC safety guidelines, so our product will generate less than $30\text{mJ}/\text{cm}^2$ at 5 m distance with max.45 min.

Feature

Safety sensor

Built-in timer

Step-by-step voice guidance

Intuitive control

Built-in timer is another active safety strategy to avoid UVC exposure for humans and animals, it can shut down UVC after disinfection stage and go back to lock stage.

Disinfection time Disinfection range	15 min	30 min	45 min
2.25 m (~10 m ²)	10.7 mJ/cm ²	21.3 mJ/cm ²	32.0 mJ/cm ²
3 m (18 m ²)	6.0 mJ/cm ²	11.9 mJ/cm ²	17.9 mJ/cm ²
3.75 m (~28 m ²)	3.8 mJ/cm ²	7.7 mJ/cm ²	11.5 mJ/cm ²
Typical Usage	Washroom	Bedroom	Living room

- Most germs including COVID-19 virus are inactivated by UVC dosage > 5 mJ/cm²
- We set double min. dosage as criteria (>10 mJ/cm²) to ensure disinfection effectiveness.



Built-in
timer



Living room
45 min*



Bedroom
30 min*



Washroom
15 min*

* Disinfection effectiveness will vary depending on disinfection time, distance and type of surface/object. See product manual/webpage for details.

*it's minimum dosage within disinfection range in the table.

Feature

Safety sensor

Built-in timer

[Step-by-step voice guidance](#)

Intuitive control

Step-by-step voice guidance is one passive safety strategy to avoid misuse UVC product and guide customer to use product easily.

- Voice guidance can support English Language
- Get voice guidance when you touch control button
- Get warning voice or status voice for each stage, like “please push and hold power button for 3 seconds to unlock product”, “system self check failed”, “disinfection process is completed”, “pls leave room and disinfection process will start soon”



Feature

Safety sensor

Built-in timer

Step-by-step voice guidance

Intuitive control

Only two buttons on the control panel, power and timer button.

It's able to unlock product, configure voice language and disinfection setting.



Intuitive
control





LED indicator for 15min., 30min. and 45min.

timer button

Power button

Control panel:

-  power button, press 3 seconds to unlock/press once to start working
-  timer button, press once to choose working min.

Press any button to stop working and back to stand-by mode.

The device is locked when 3 LED indicators are all lighting

The device is in a fault condition when 3 LED indicators are flickering.

Why Philips UVC lighting





Why Philips UV-C lighting



All bacteria and viruses tested to date respond to UV-C disinfection²



In laboratory testing, Signify's UV-C light sources inactivated 99% of SARS-CoV-2 virus on a surface with an exposure time of 6 seconds³



Simple to use, with clear control panel and voice guidance



Disinfects surfaces and objects in minutes¹



Added layer of protection with sensors and timers



Philips has 35 years' experience in UV-C lighting



Dedicated driver design for disinfection effectiveness

1 Disinfection effectiveness will vary depending on disinfection time, distance and type of surface/object. See product manual/website for details.

2 Fluence (UV Dose) Required to Achieve Incremental Log Inactivation of Bacteria, Protozoa, Viruses and Algae Revised, updated and expanded by Adel Haji Malayeri, Majid Mohseni, Bill Cairns and James R. Bolton. With earlier contributions by Gabriel Cheveffis (2006) and Eric Caron (2006) With peer review by Benoit Barbeau, Harold Wright (1999) and Karl G. Linden.

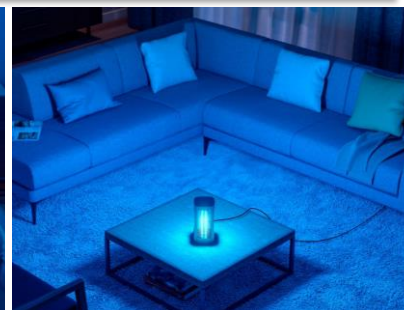
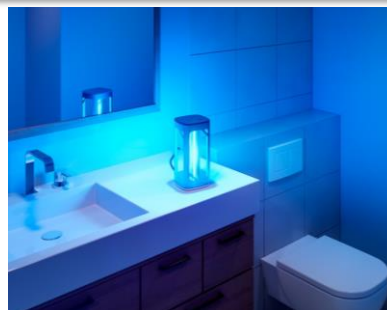
3 Data made available to us by the National Emerging Infectious Diseases Laboratories (NEIDL) at Boston University, which has been collected from a laboratory experiment conducted by Dr. Anthony Griffiths (Associate Professor of Microbiology at Boston University School of Medicine) and his team at the premises of the NEIDL (such data will be the subject of a forthcoming scientific publication by Boston University), shows that Signify's UV-C light sources irradiating the surface of a material inoculated with SARS-CoV-2 (the virus that causes the COVID-19 disease) at a UV-C dose of 22mJ/cm² (exposure time 6 seconds) resulted in a 99% reduction of the SARS-CoV-2 virus present on that surface. This study determined that a UV-C dose of 22mJ/cm² results in a reduction of 99.9999% of SARS-CoV-2 virus on that surface (exposure time 25 seconds). Research variables are available upon request.



Appropriate UVC dosage for home disinfection

Balance disinfection effectiveness and safety

Disinfection time	15 min	30 min	45 min
UVC dosage	10.7 mJ/cm ²	11.9 mJ/cm ²	11.5 mJ/cm ²
Room area	~10 m ²	~18 m ²	~28 m ²
Typical Usage	Washroom	Bedroom	Living room



- Most germs including COVID-19 virus are inactivated by UVC dosage $> 5 \text{ mJ/cm}^2$
- It's max UVC radiation level for safety according to GLA UVC safety guideline, we need to select appropriate UVC dosage (UVC radiation power and timing) to avoid harmful to human.

Safety sensor design



Safety sensor

As UV-C exposure can be harmful to eyes and skin, the built-in safety sensor detects movement from humans and animals, immediately locking the product



- Select high quality and reliable microwave sensor
- Sensor detection range is 5m radius*
- Sensor self check after power on, make sure sensor is active during the whole process.

VS.

Only built-in timer without sensor



built-in timer and sensor



Detection range : low
UVC power: Not optimized
Timing: Not optimized

- It's a high risk without sensor in UVC product, especially home disinfection application, for example, person may not leave room in time after start UVC product, person or pets may enter room during disinfection process.
- It's max UVC radiation level for safety according to GLA UVC safety guideline, we need to design properly for sensor detection range, UVC power and timing, which avoid harmful to human.

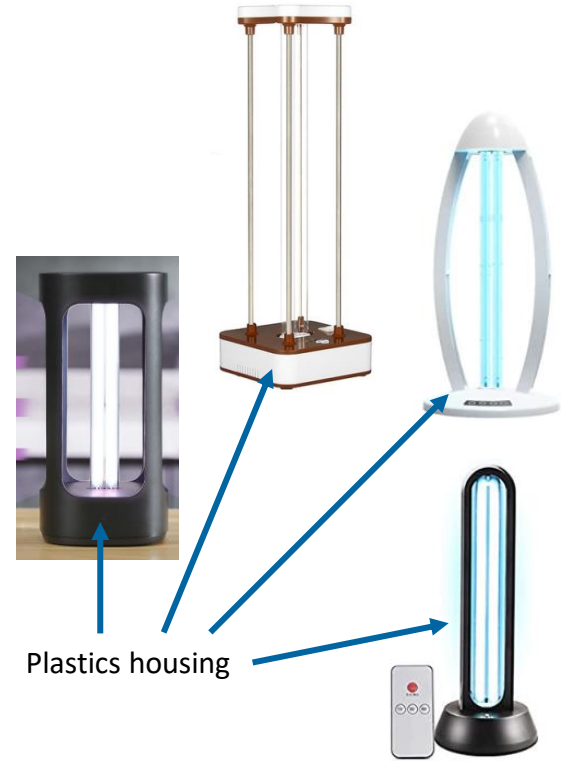
Anti-UVC material for housing and wire



Aluminum housing

Metal coating

VS.



After short term UVC exposure closely, normal plastics material becomes crisp, easily damaged.

High quality of the Philips UVC tube



VS.



- Philips UVC tube has higher efficiency, WPE >30%, competitors have 20-25%, which means same disinfection effect with less power, our total power is 24W, others can be higher than 30W.
- Philips UVC tube has good radiation maintenance, >85% @9000hrs, competitors have poor radiation maintenance, some no brand UVC tube can drop 50% radiation power after 500hrs.
- We optimize driver design for Philips UVC tube in our product, which make sure max output and good radiation maintenance during the life.

Simple to use, with clear control panel and voice guidance




Step-by-step
voice guidance



VS.

Remote control



Ultraviolet
Lamp

APP control



- Step-by-step voice guidance is an innovative design in UVC product, cons customer can use it easily.
- There is a potential safety risk to use remote control or APP control.

