

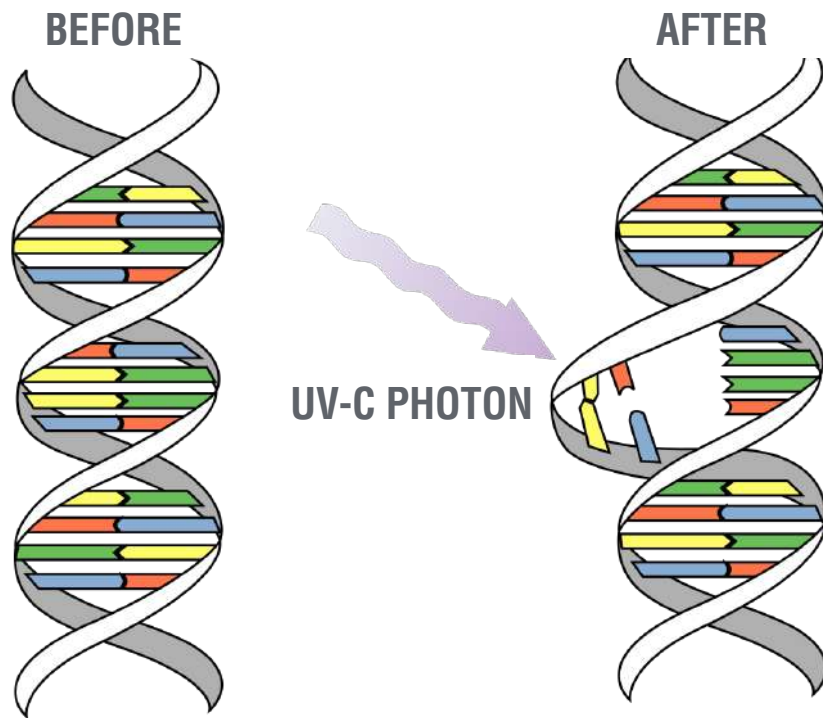
Welt Electronic SpA

NEW UV-C LED  
SOLUTIONS

## Is it possible to sanitize environments and surfaces using UV-C LEDs?

- Already known the antibacterial and antiviral power of ultra-violet light, LEDs represent for sure an efficient solution for sterilization of environments and surfaces.
- The UV-C LEDs are suitable for water, air and surface treatments application, in skin treatments, in medical spectroscopy, in fluorescence analyzers, in food and pharmaceutical transformation, in horticulture lighting.
- The COVID-19 infection can be caused touching contaminated surfaces, where the virus can survive up to three days (both on plastic and steel), for this reason it becomes essential to minimize this risk.
- The UV-C light, in wavelengths from 200nm to 280nm, inactivates and kills at least two more near-relatives of COVID-19's viruses, the SARSCOV-1 and MERS-CoV, so it's conceivable that it can be equally useful to inactivate COVID-19 as well.

# Efficient against 99,99% of germs and bacteria



From a scientific study about the antimicrobial power of UV-C LEDs we know that they have an efficiency of 4 Log with the elimination of 99,99% of tested microorganisms: E. Coli, Staphylococcus Aureu (MRSA) and Monilia Albican.

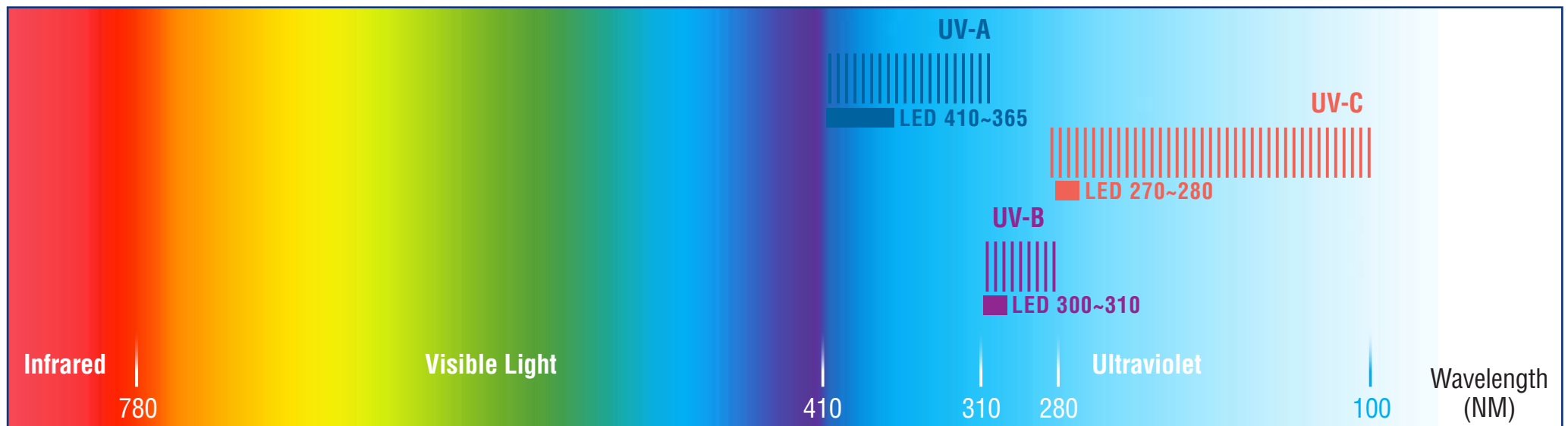
The ultraviolet UV-C LED ray starts a photochemical reaction inside the germs that destroys their DNA, RNA and/or proteins making them unable to reproduce.

| Irradiation Time                    | 0 sec. | 10 sec. | 20 sec. |
|-------------------------------------|--------|---------|---------|
| <b>E.coli<br/>(10,000 dilution)</b> |        |         |         |
| <b>Peak Wavelength<br/>280nm</b>    |        |         |         |
| <b>Radiant Flux<br/>59mW</b>        |        |         |         |

\*Note: This data is a reference value, hence Nichia cannot make guarantee these results,  
Please treat this data the as reference  
Information from Nichia Model No, NCSU334BT Product Specification

# UV Applications

The UV technology employed to LED lamps can be very useful in lots of applications and it's used in a different way depending on the intensity and wavelength (UV-A, UV-B, UV-C). In particular, it can be very efficient to **reduce the quantity of bacteria, the virulence of harmful organisms, the presence of pathogens and bad smells in general.**



| Industrial                               | Residential         | Bio           |
|------------------------------------------|---------------------|---------------|
| Counterfeit money detector/Entertainment | Sterilization       | Horticulture  |
| Ink (Adhesion/Ink/Nail)                  | Indoor Tanning      | Dentist       |
|                                          | Surface Distinction |               |
|                                          | Photocatalyst       | Sterilization |
|                                          | Water Distinction   |               |
|                                          | Mosquito Killer     |               |

# Main UV LED applications



## WATER DISINFECTION

**Drinkable water for domestic use**

**Waste water**

**Swimming pool**

**Water purifier**



## AIR DISINFECTION

**Air conditioning system**

**Office**

**Healthcare facilities**



## SURFACES DISINFECTION

**Food and pharmaceutical packaging**

**Aseptic area**

**Medical equipment**

**Restaurant and kitchen**

**Docking station for mobile phones**

**Beauty equipment**

**Baby bottle sterilizer**

# UV-C LED components solutions



NC4U334BRT

NCSU334BT

NCSU434BT

NCSU434AT



PU35CL1-V1

PU35CM7-V0

PU35CM1-V3

PU35CH1-V0

PU35CM1-V3

PU35CH1-V0

PU35CM1-V6

PU35CH1-V1

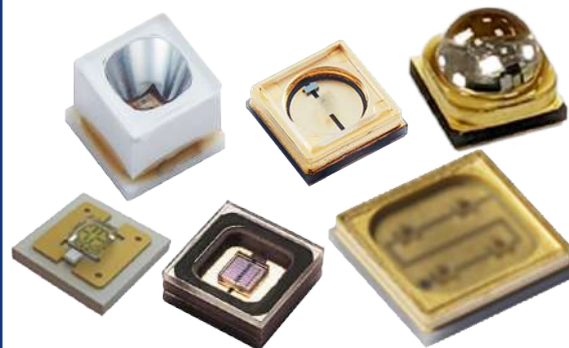
PU35CM2-V0

PU35CH2-V0

PU35CM3-V0

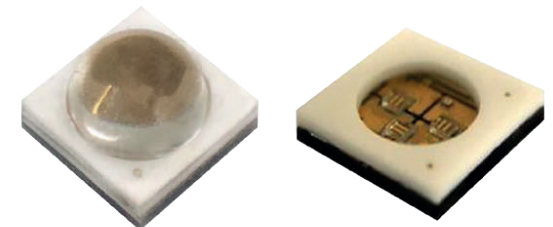
PU68CH1-V0

**Coming Soon:**  
**PU68CH1-VX [Q4 2022]**



UVK5050Q11-B20

UVK5050Q37-G0

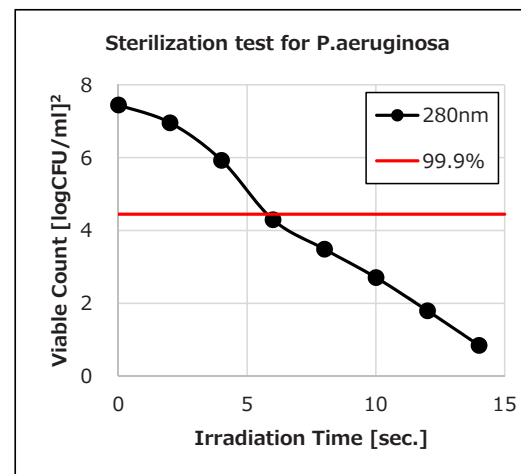


# NICHIA UV-C LED

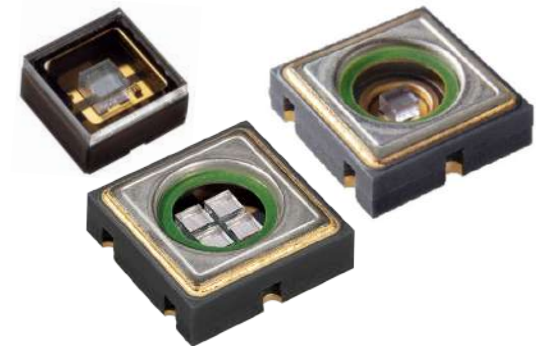
The Nichia's UV-C LED (334 and 434 series) are designed to satisfy the sterilization mass market demand through the solid-state lighting. These small size but highly efficient LEDs guarantee 40% more efficiency than competitors. This solution ensures the maximum miniaturization system and long-time performances more stable than the actual UV-C technologies on market.

|                               |                        |              |    |      |
|-------------------------------|------------------------|--------------|----|------|
| Part No.                      |                        | NCSU334B     |    | Unit |
| Wavelength Rank               |                        | 280          |    | nm   |
| Test Condition                | Number of LED          | 1            |    | pc.  |
|                               | Forward Current        | 350          |    | mA   |
|                               | Peak Wavelength        | 280          |    | nm   |
|                               | Radiant Flux           | 59           |    | mW   |
|                               | Working Distance       | 50           |    | mm   |
| Irradiation <sup>1</sup> Time | Gram Negative Bacteria | E.coli       | 14 | sec. |
|                               |                        | P.aeruginosa | 6  |      |
|                               | Gram Positive Bacteria | S.aureus     | 11 |      |

<sup>1</sup> Irradiation time for 99.9% sterilization.



<sup>2</sup> log = Logarithm  
CFU = Colony Forming Unit



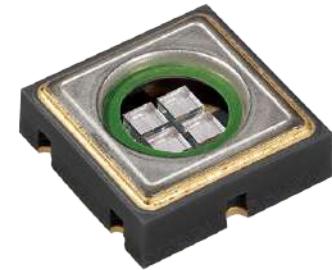
| Irradiation Time                                           | 0 sec.<br>(10,000 dilution) | 2 sec.<br>(10,000 dilution) | 4 sec.<br>(10,000 dilution) | 6 sec.<br>(10,000 dilution) | 8 sec.<br>(10,000 dilution) |
|------------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| P.aeruginosa<br>Peak Wavelength 280nm<br>Radiant Flux 59mW |                             |                             |                             |                             |                             |

Note: This data is a reference value, hence Nichia cannot make guarantee these results. Please treat this data the as reference.

# NICHIA UV-C LED

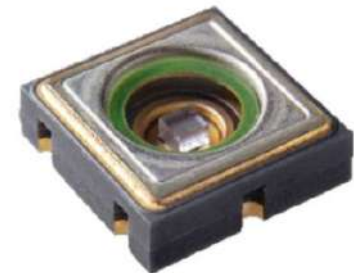
## SMD NC4U334BRT UV-C LED features

- High performances with typical radiant flux 200mW
- Peak wavelength 280nm
- Typical voltage 22.5 V, typical current 350mA, maximum current 500mA
- Typical power consumption: 7.87W
- 110° deg viewing angle
- Dimensions (LxWxH): 6.8x6.8x2.12mm



## SMD NCSU334BT UV-C LED features

- High performances with typical radiant flux 70mW
- Peak wavelength 280nm
- Typical voltage 5.5 V, typical current 350mA, maximum current 500mA
- Typical power consumption: 1.92W
- 115° deg viewing angle
- Dimensions (LxWxH): 6.8x6.8x2.12mm



## Applications

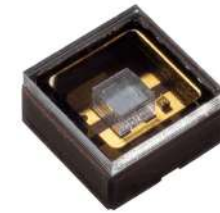
- Disinfection
- Sterilization



# NICHIA UV-C LED

## SMD NCSU434BT UV-C LED features

- High performances with typical radiant flux 17,5mW
- Peak wavelength 280nm
- Typical voltage 5.3 V, typical current 350mA, maximum current 500mA
- Typical power consumption: 1.99W
- 110° deg viewing angle
- Dimensions (LxWxH): 3.5x3.5x1.72mm



## SMD NCSU434AT UV-C LED features

- High performances with typical radiant flux 17,5mW
- Peak wavelength 280nm
- Typical voltage 5.3 V, typical current 100mA, maximum current 150mA
- Typical power consumption: 0.53W
- 110° deg viewing angle
- Dimensions (LxWxH): 3.5x3.5x1.72mm

## Applications

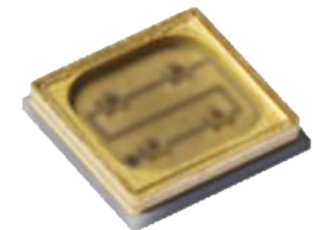
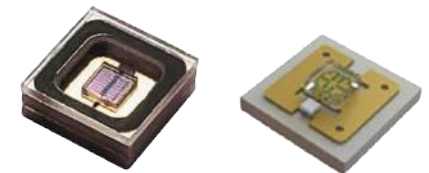
- Disinfection
- Sterilization

# LEXTAR UV-C LED

The LEXTAR UV-C LED series includes many different types and powers to be suitable for everyday objects and many other applications.

Test Method: JIS Z 2801  
UV LED Model: PU35CM1 V1

| Test Bacteria                      | Concentration of Bacteria (CFU/mL) | Concentration After Testing (CFU/mL) |                     | Antibacterial Efficacy (%) |
|------------------------------------|------------------------------------|--------------------------------------|---------------------|----------------------------|
|                                    |                                    | Reference                            | Treated             |                            |
| Escherichia coli (ATCC 8739)       | 9.5×10 <sup>5</sup>                | 7.9×10 <sup>5</sup>                  | 3.3×10 <sup>4</sup> | 95.82 (1 min)              |
|                                    |                                    |                                      | 1.7×10 <sup>4</sup> | 97.85 (3 min)              |
|                                    |                                    |                                      | 6.5×10 <sup>3</sup> | <b>99.18</b> (5 min)       |
| Staphylococcus aureus (ATCC 6538P) | 4.3×10 <sup>5</sup>                | 3.8×10 <sup>5</sup>                  | 2.5×10 <sup>3</sup> | 93.42 (1 min)              |
|                                    |                                    |                                      | 2.3×10 <sup>3</sup> | <b>99.39</b> (3 min)       |
|                                    |                                    |                                      | 1.6×10 <sup>3</sup> | <b>99.58</b> (5 min)       |
| Pseudomonas aeruginosa (ATCC 9027) | 7.2×10 <sup>5</sup>                | 6.7×10 <sup>5</sup>                  | 1.1×10 <sup>4</sup> | 98.36 (1 min)              |
|                                    |                                    |                                      | 2.8×10 <sup>3</sup> | <b>99.58</b> (3 min)       |
|                                    |                                    |                                      | 9.6×10 <sup>2</sup> | <b>99.86</b> (5 min)       |



# LEXTAR UV-C LED

## APPLICATIONS



### High power Air disinfection

- Ultra-high radiant intensity
- High flow rate (>2L/min)



### Mid power Water disinfection

- High radiant intensity
- Low flow rate (1-2L/min)

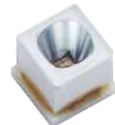


### Low power Surface disinfection

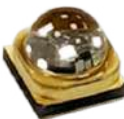
- Wide angle
- High performance/cost ratio
- Static state



PU35CL1-V1  
**3,5 mW**  
125° - 3535



PU35CM2-V0  
**12 mW**  
35° - 3535



PU35CM1-V6  
**14 mW**  
60° - 3535



PU35CM1-V3\*  
**15 mW**  
125° - 3535

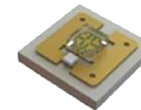


PU35CM7-V0  
**25 mW**  
125° - 3535

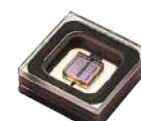
PU35CM3-V0  
**24 mW**  
125° - 3535



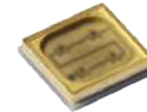
PU35CH1-V0\*  
**50 mW**  
125° - 3535



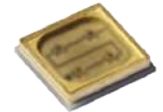
PU35CH1-V1  
**80 mW**  
140° - 3535



PU35CH2-V0  
**50 mW**  
125° - 3535



PU68CH1-V0  
**70 mW**  
125° - 6868



PU68CH1-VX  
**200 mW**  
125° - 6868

**Coming Soon:**  
[Q4 2022]

Typical current

20mA

100mA

200mA

350mA

500mA

1400mA

Maximum current

30mA

150mA

300mA

500mA

600mA

2000mA

\* Available 265nm

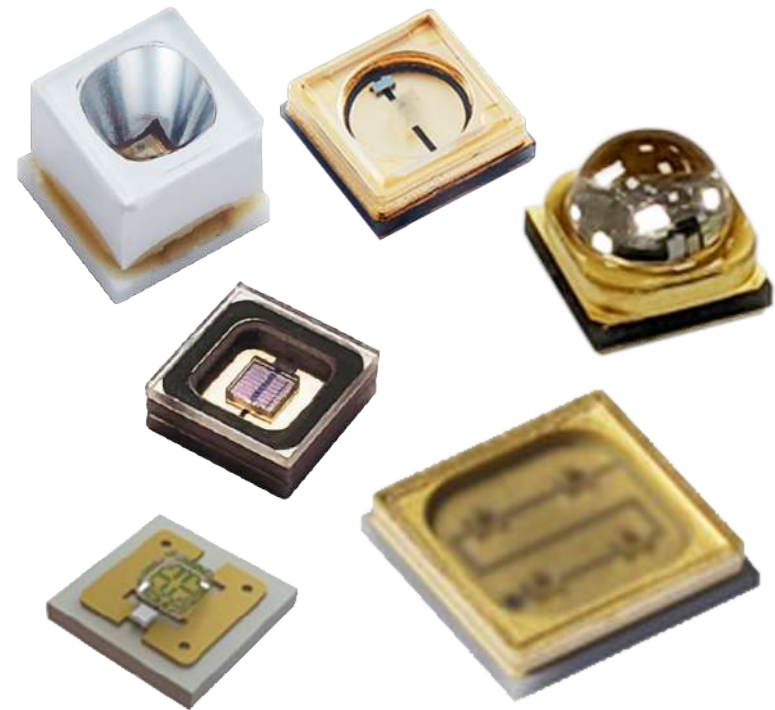
# LEXTAR UV-C LED

## Features

- SMD standard package
- UV-C Wavelength from 265nm to 280nm
- Different emitting angle options from 35° to 140°
- High reliability, long life
- Environmentally friendly, RoHS compliance

## Applications

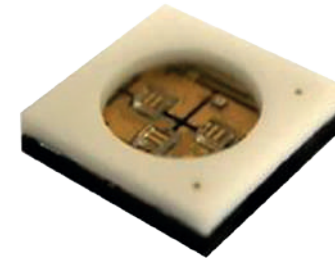
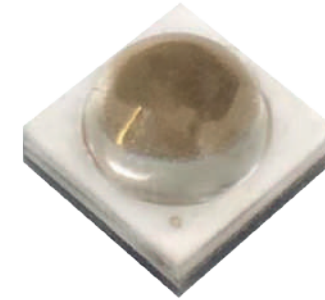
- Surface sterilization
- Food and pharmaceutical processing
- Air and water disinfection



# CT MICRO UV-C LED

## Features

- SMD standard package
- UV-C Wavelength from 270nm to 280nm
- Different emitting angle options from 60° to 120°
- High reliability, long life
- Environmentally friendly, RoHS compliance



## Applications

- Surface sterilization
- Food and pharmaceutical processing
- Air and water disinfection

## HARVATEK

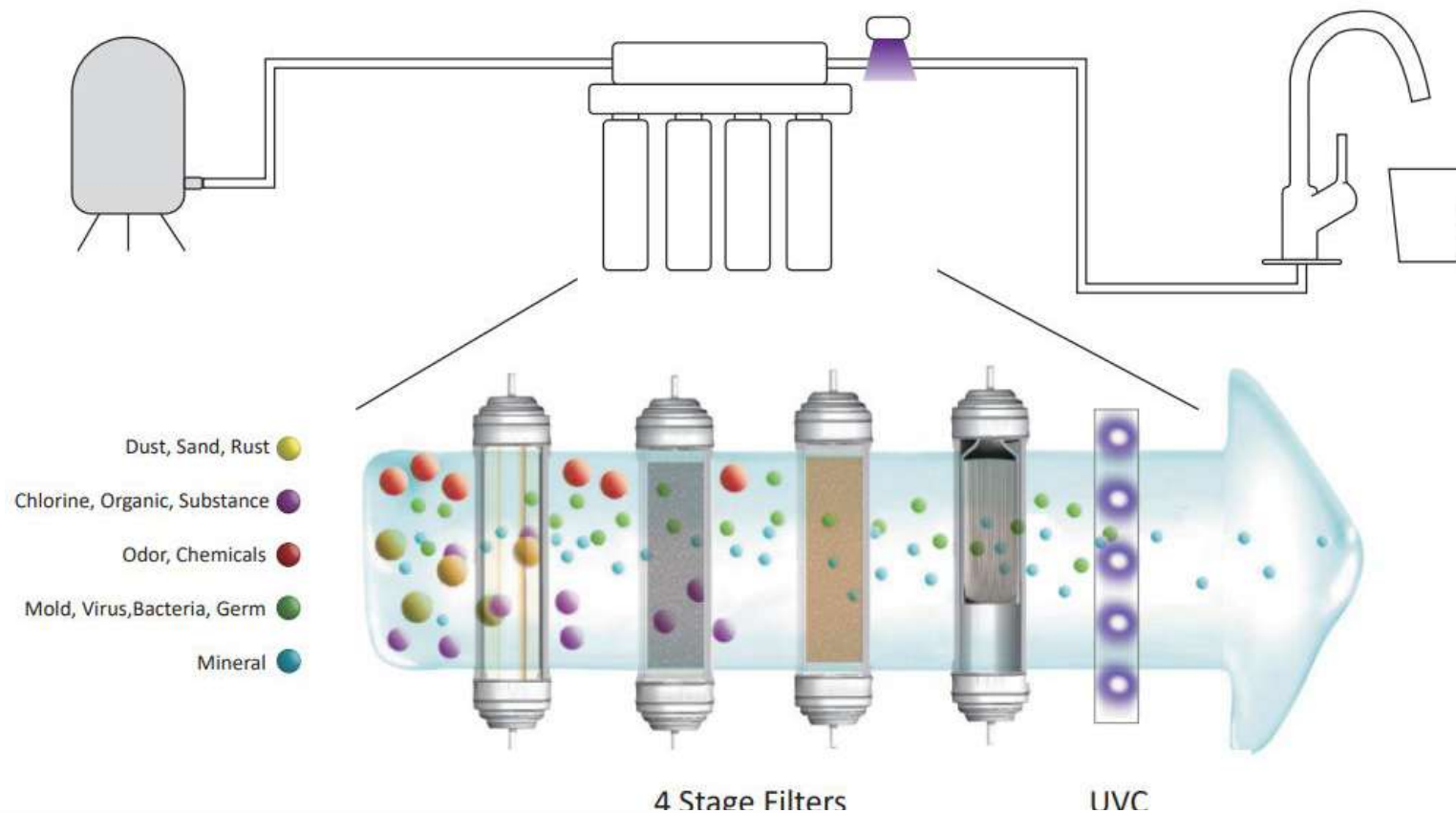
UV-C LED MODULE



UV-C LED MODULE



# HARVATEK UV-C LED MODULES



Water flux type

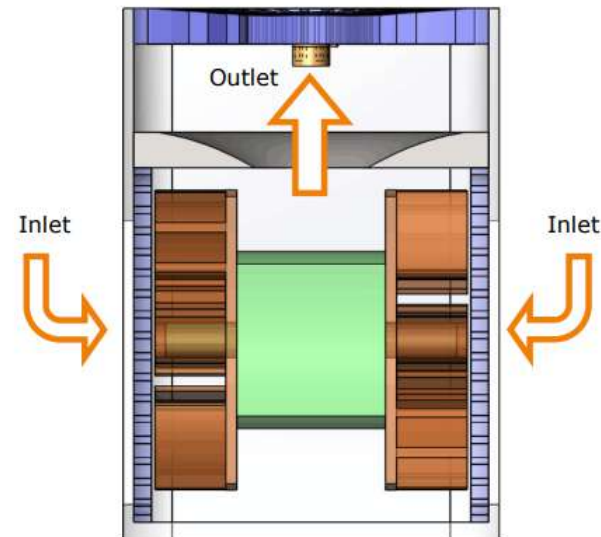
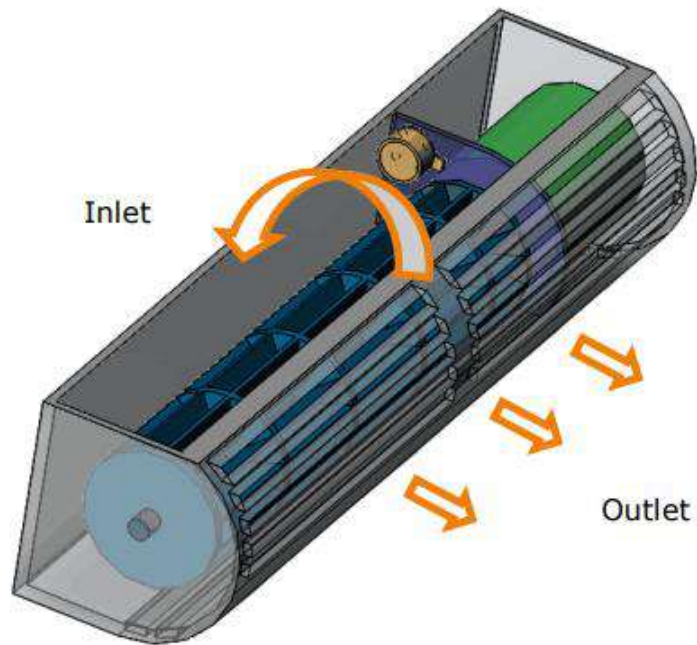
## TEST RESULT(S):

| Test item(s)     | Unit(s)   | Test method(s)    | Test result(s)        |                          | Removal rate(s)(%)** |
|------------------|-----------|-------------------|-----------------------|--------------------------|----------------------|
|                  |           |                   | Influent spiked water | Effluent filtrated water |                      |
| Total coliforms* | cfu/100mL | GB/T 5750.12-2006 | $8.0 \times 10^4$     | <1                       | >99.99               |

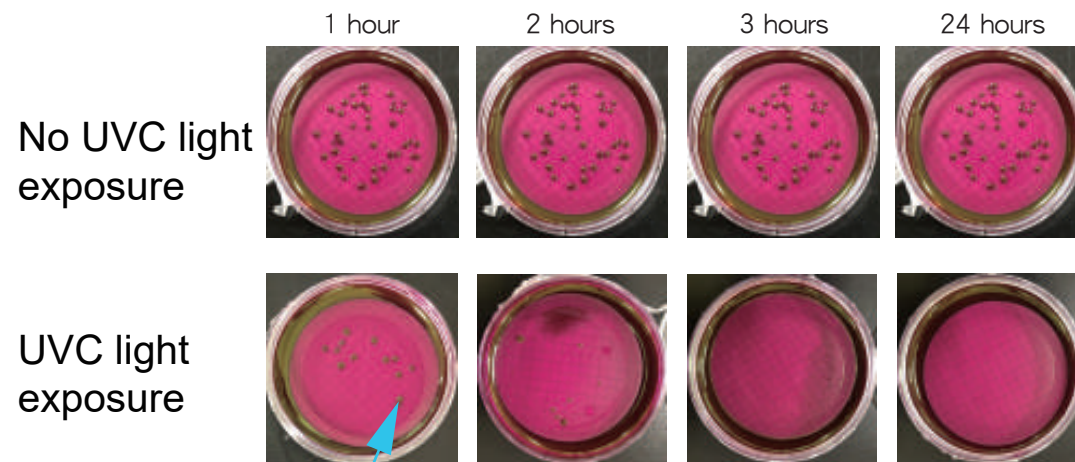




# HARVATEK UV-C LED modules



Air type sterilization



100% sterilization rate  
in petri dishes  
after UVC LED irradiation

Bacterial contamination presence



# LUX LUCIS UV-C LED modules

**LUX LUCIS offers UV-C LED modules designed with highly dissipative materials and completely customized in dimension, LED wheelbase and total radiant power.**

**Possibility to realize spots or driven strips in 12/24Vdc voltage and different dimensions and shapes modules as well. Suitable with NICHIA, LEXTAR and CT MICRO components depending on the required application type. Suitable with a wide range of LEDiL optics.**

- IMS material aluminum-based with 1/1.2/1.6 mm thickness
- Copper circuit with up to 70  $\mu\text{m}$  of thickness
- Surface in passivated copper
- cUL/CE marking
- Customizable with customer mark



# Optics for UV-C LED modules and components

**LEDiL<sup>®</sup>**

**VIOLET**



**STELLA**



**ZORYA**



**JENNY**



**SAGA**



**G2-ROSE-UV / G2-NIS033U**



**SAKURA**



# LEDIL optics for UV-C LEDs



## VIOLET

- 12 up lens,
- Clusters or single LEDs 3535, 6868, CSP

UV-A

UV-B

UV-C



## STELLA

- Clusters up to 30 mm
- 3535, 6868 packages, CSP

UV-A

UV-B

UV-C



## ZORYA

- Big clusters
- Clusters 3535, 6868, CSP

UV-A

UV-B

UV-C



## JENNY

- Clusters up to 11 mm
- 3535, CSP

UV-A

UV-B



## SAGA

- Clusters up to 14 mm
- 3535, 6868, CSP

UV-A

UV-B



## G2-ROSE-UV / G2-NIS033U

- Single LEDs 3535/6868

UV-A

UV-B



## SAKURA

- Clusters up to 25 mm
- 3535, 6868, CSP

UV-A

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C.F. e P.I. 03714360488

Social Capital: € 2.000.000 i.v.

Registro Pile: IT19040P00005244