



UV-C in the poultry industry

Dinies Technologies UV-C Tunnel

Fields of Application of UV-C Disinfection in the Poultry Industry

Disinfection of Surfaces and Air

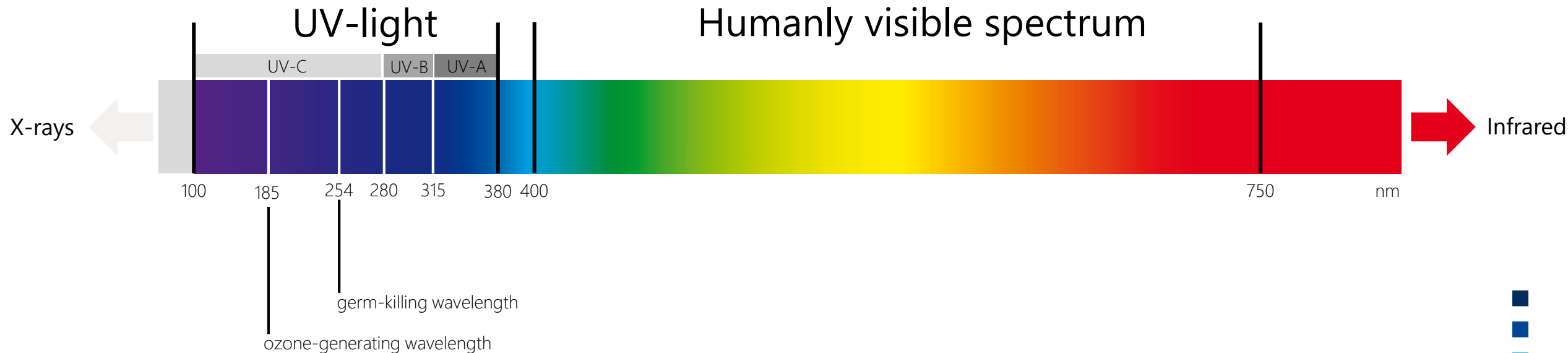


1. Disinfection of hanging chicken
2. Disinfection of chicken or parts
3. Disinfection of packed chicken
4. Disinfection of changing rooms
5. Disinfection of circulated air

What is UV Light?

How does it work?

UV light is invisible to the human eye, but it can be used to eliminate microorganisms



4 Factors for UV-C Disinfection

What is important?



1.



2.



3.



4.

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1. Microorganisms
 2. Distance
 3. UV-C power
 4. Time

Important Radiation Doses

Lethal doses to kill microorganisms

Microorganism	Distance	Radiation dose*	Time
<i>Bacteria</i>			
Escherichia coli	5 cm	9 mWs/cm ²	0,74 sec
Legionella pneumophila	5 cm	2,8 mWs/cm ²	0,23 sec
Mycobacterium tuberculosis	5 cm	30 mWs/cm ²	2,46 sec
<i>Viruses</i>			
Influenza virus	5 cm	10,2 mWs/cm ²	0,84 sec
SARS-CoV-2	5 cm	10,6 mWs/cm ²	0,80 sec
<i>Mold spores</i>			
Aspergillus niger	5 cm	396 mWs/cm ²	32,46 sec

*radiation dose necessary for 90% disinfection / log 1

Fields of Application

Disinfection of hanging chicken

- Chicken are hanging side by side at a conveyor with a speed of 6000 birds per hour
- Estimated conveyor speed is 17 m/min
- Chicken are hanging always in the same position
- Environmental temperature is 0-4°C

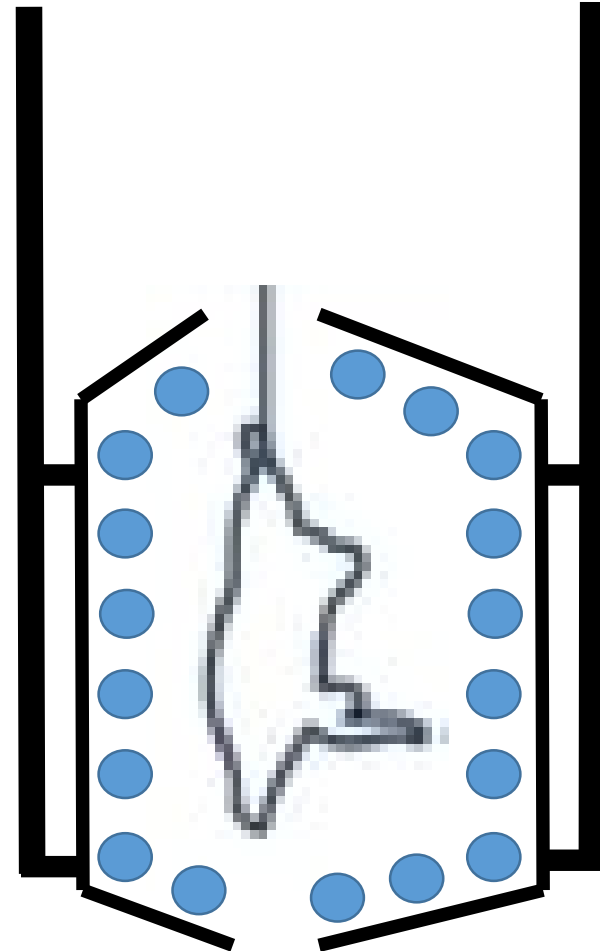


Fields of Application

Disinfection of hanging chicken

UV Solution

- UV Channel around the chicken conveyor
- Using UVC light with 254nm
- For the speed of 17 m/min, a disinfection length of 3 m is required, which means two UV sections
- Each UV section is 1,4m long and has 18 UV lamps, with 119W each
- Total lamp power would be 4,5 kW
- Total UVC power would be 1350 W
- The lamps are watertight and covered with a splitter protection to prevent glass parts in the production
- Lifetime of the lamps are 12000 h
- System is controlled by a Siemens PLC, including lamp control, lifetime control, safety controls, etc.
- Design is made of stainless steel
- The UV channel can be mounted at the ceiling, on the floor or at the wall, depending on the circumstances



Fields of Application

Disinfection of hanging chicken

Splitter protection

- If a glass would be damaged through cleaning are other processes, it is the risk that glass parts are coming into the production
- With a transparent Teflon layer, which is shrunk on the glass tube, we prevent that glass parts are getting into the production.



Fields of Application

Disinfection of chicken or chicken parts

- Chicken or chicken parts are transported on a conveyor belt
- Estimated conveyor speed > 10 m/min
- Chicken are laying always in the same or similar position
- Environmental temperature is 0-4°C



Fields of Application

Disinfection of chicken or chicken parts

UV Solution

- UV Tunnel with 360° disinfection
- Using UVC light with 254nm
- Depending on the speed, there could be one or two section solution required
- The number of lamps depends on the belt width, available from 100-800mm
- Each lamp has a power of 119W.
- The lamps are located on the top and below the stainless conveyor
- The lamps are watertight and covered with a splitter protection to prevent glass parts in the production
- Lifetime of the lamps are 12000 h
- System is controlled by a Siemens PLC, including lamp control, lifetime control, safety controls, etc.
- Design is made of stainless steel



Fields of Application

Disinfection of packed chicken

- Chicken or chicken parts are packed into a tray
- Additional disinfection method might be required
- Environmental temperature is 0-4°C



Fields of Application

Disinfection of packed chicken

UV Solution

- UV Cover with disinfection from the top
- Using UVC light with 254nm
- Depending on the speed, there could be one or two section solution required
- The UV Cover can be built above existing conveyor lines
- The number of lamps depends on the belt width, available from 100-800mm
- Each lamp has a power of 119W.
- The lamps are located on the top
- The lamps are watertight and covered with a splitter protection to prevent glass parts in the production
- Lifetime of the lamps are 12000 h
- System is controlled by a Siemens PLC, including lamp control, lifetime control, safety controls, etc.
- Design is made of stainless steel



Fields of Application

Disinfection of changing rooms

- Changing rooms are the channel into the high care area
- Strict hygienic conditions must be guaranteed in this room
- Regular person traffic in the changing room
- Risk of cross contamination



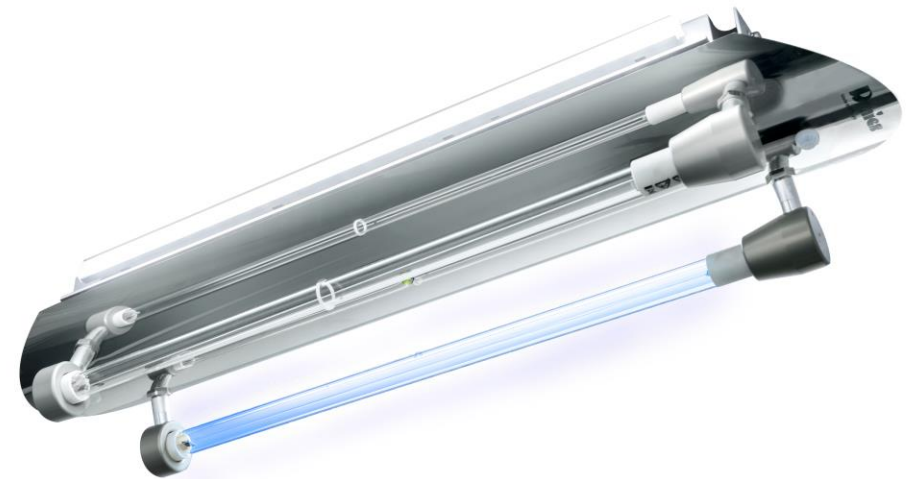
Fields of Application

Disinfection of changing room

UV Solution

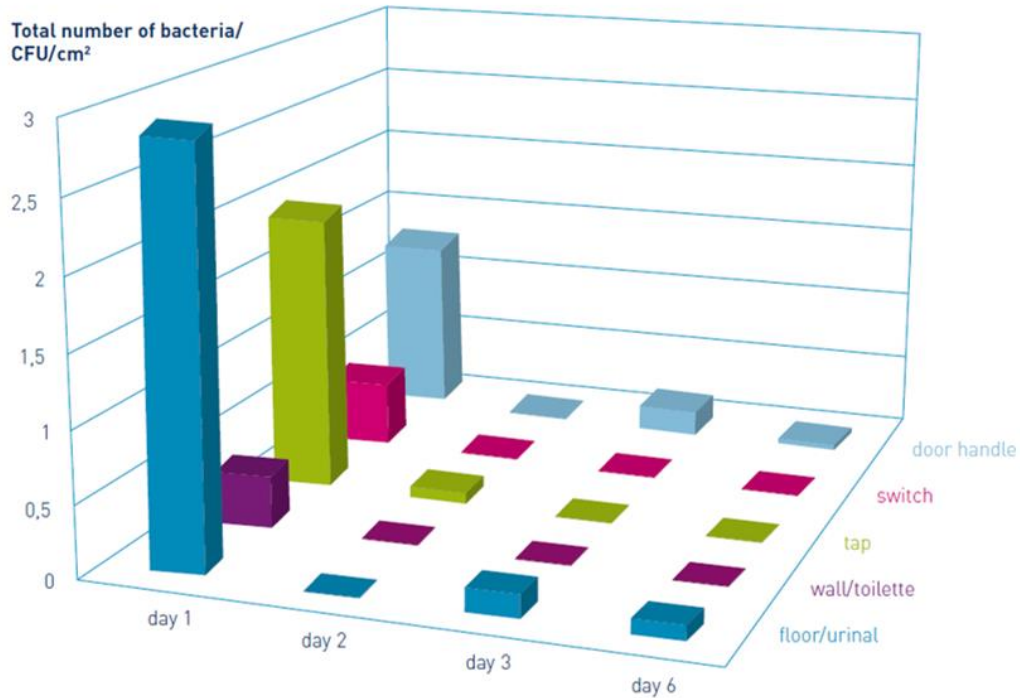
- Automatic surface and air disinfection with the CleanO₃mat
- Using UVC light with 254nm for air and surface disinfection
- Using UVC light 185nm to generate a small amount of ozone to reduce bad smell in the room
- Automatic disinfection after each usage
- LED light is integrated as well
- Automatic safety control by two motion defectors, which switch off the lamps if persons are in the room.
- Lamp lifetime and defect control
- Design is made of stainless steel

CleanO₃mat



Fields of Application

Disinfection of changing room



Confirmation of Long-Term Effectiveness in a public toilet

- Before the first use, the bacterial count was measured at several points in a toilet
- In the following days, the germ load rate dropped permanently to values close to 0 CFU
- These values were achieved even when the usual wipe disinfection was suspended

Fields of Application

Disinfection of circulated air

- Air control is an important factor in the food industry
- Modern HVAC systems are designed to control the temperature and humidity in the production facilities
- In hot countries there is a risk that mold can grow in such systems
- During the corona pandemic it was found that the corona virus was distributed through the HVAC system



Fields of Application

Disinfection of circulated air

UV Solution

- UV Modules can be build in to the ducts of a HVAC system
- Using UVC light with 254nm for air and surface disinfection
- The number of lamps are depending on the air flow in the HVAC system
- Automatic disinfection of the circulating air
- Controlled by a Siemens PLC with lamp lifetime and defect control.
- Energy saving function with automatic adaption of the UV power
- Design is made of stainless steel





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