EVERGEP

MAKING THE WORLD A BETTER PLACE

UV-C disinfection in public transport

Risks through Influenza virus

Statistics according to the Robert Koch Institute

	2018/2019	2017/2018	2016/2017	2015/2016	2014/2015	2013/2014
Number of illnesses*	182.000	334.000	114.000	71.000	70.000	6.200
Hospitalizations*	40.000	60.000	26.000	13.000	11.000	1.400
Consultations**	3.800.000	9.000.000	5.950.000	4.100.000	6.200.000	780.000
Incapacity for work***	2.300.000	5.300.000	3.400.000	2.200.000	3.700.000	430.000
Deaths****	954	1.674	722	237	274	23
Excess estimate*****	N/A	N/A	22.900	N/A	21.300	N/A

* Cases confirmed by laboratory diagnostics (rounded)
** Estimate: excess consultations (rounded)
*** Estimate: excessive incapacity for work or need for care among children and non-employed persons (rounded)
**** Confirmed Deaths by a laboratory
***** Conservative estimates

Source: Seasonal reports of the Influenza Working Group, published by the Robert Koch Institute
https://influenza.rki.de/Saisonbericht.aspx

Risks through pandemics

Numbers of infections and deaths

COVID-19

- > 2.100.000 victims through the corona virus
- > 98.000.000 infected

SARS

- > 1.000 victims in Asia through SARS
- > 8.000 infected

Ebola

- > 11.000 victims through Ebola
- > 21.000 infected

MERS

- > 500 victims through MERS
- > 1.500 infected

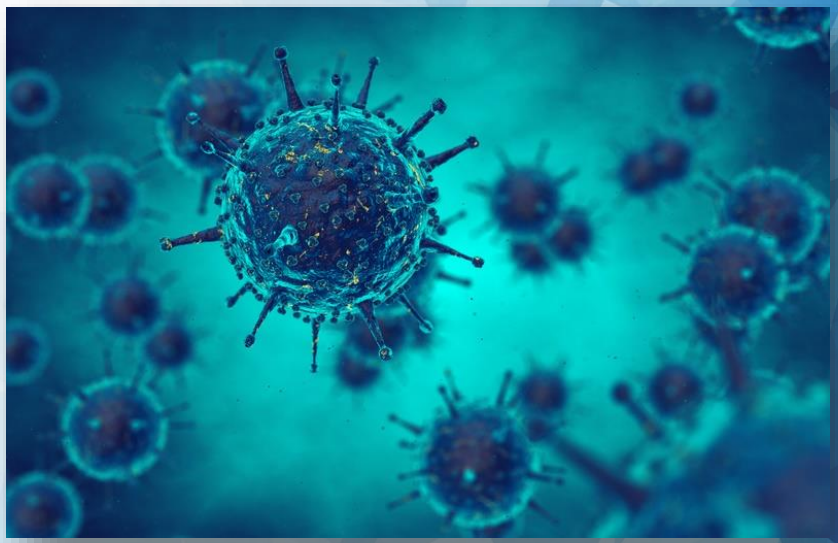
EVERGEP

MAKING THE WORLD A BETTER PLACE

Risks in public transportation

Risk of infection in buses and trains

- There is still a risk of infection in buses and trains despite the requirement to wear a mask
- The indoor air in public transport regularly becomes a disease carrier
- Passengers are exposed to high levels of germs in the air
- The infection routes are short and it is easy to get infected through the air in the room



Risk of infection in buses and trains

The problem

- *Permanent risk of infection*
- *High volume of people*
- *Uncomfortable atmosphere*

The goal

- *Lower the risk of contagion*
- *Reduce the germ content in the air*
- *Keep the risk of infection low*

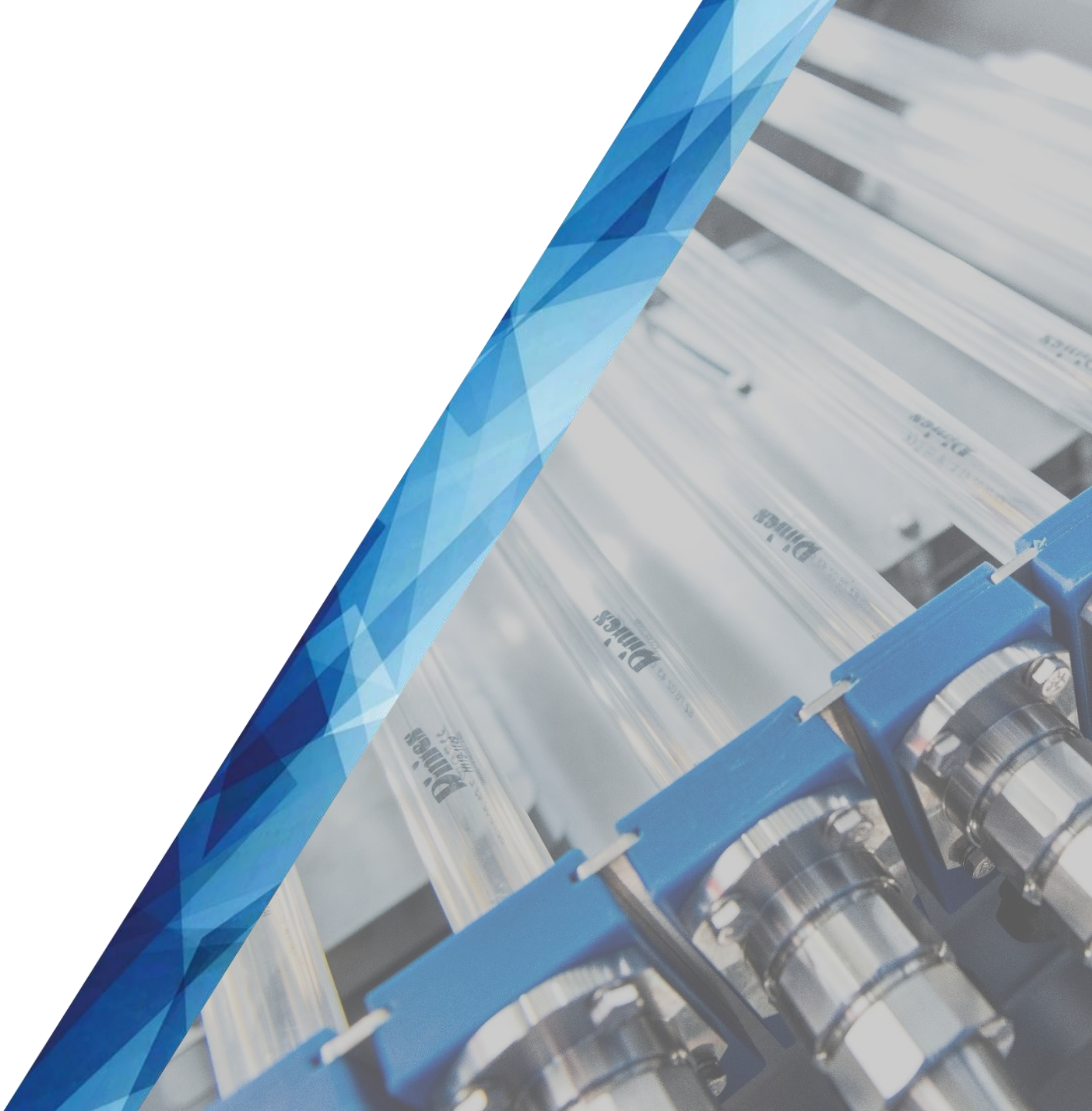
The solution

- *Disinfection of the room air with UV-C light*
- *Continuous & automatic air disinfection*
- *Specially made UV-C disinfection system*

EVERGEP

MAKING THE WORLD A BETTER PLACE

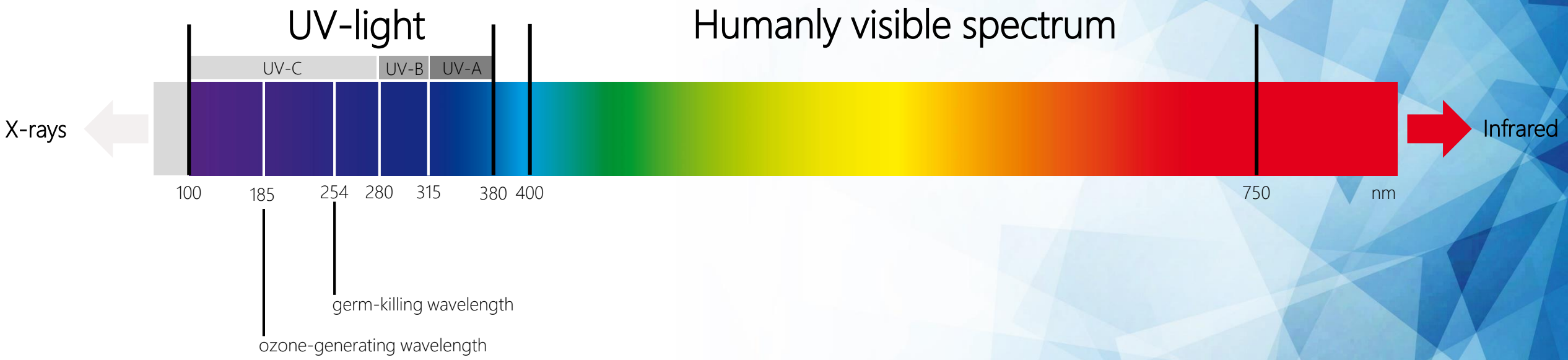
UV-C light



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.

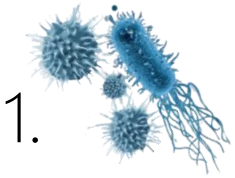
3.

4.

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

Important radiation doses

Lethal doses to kill microorganisms

1. 
2. 
3. 
4. 

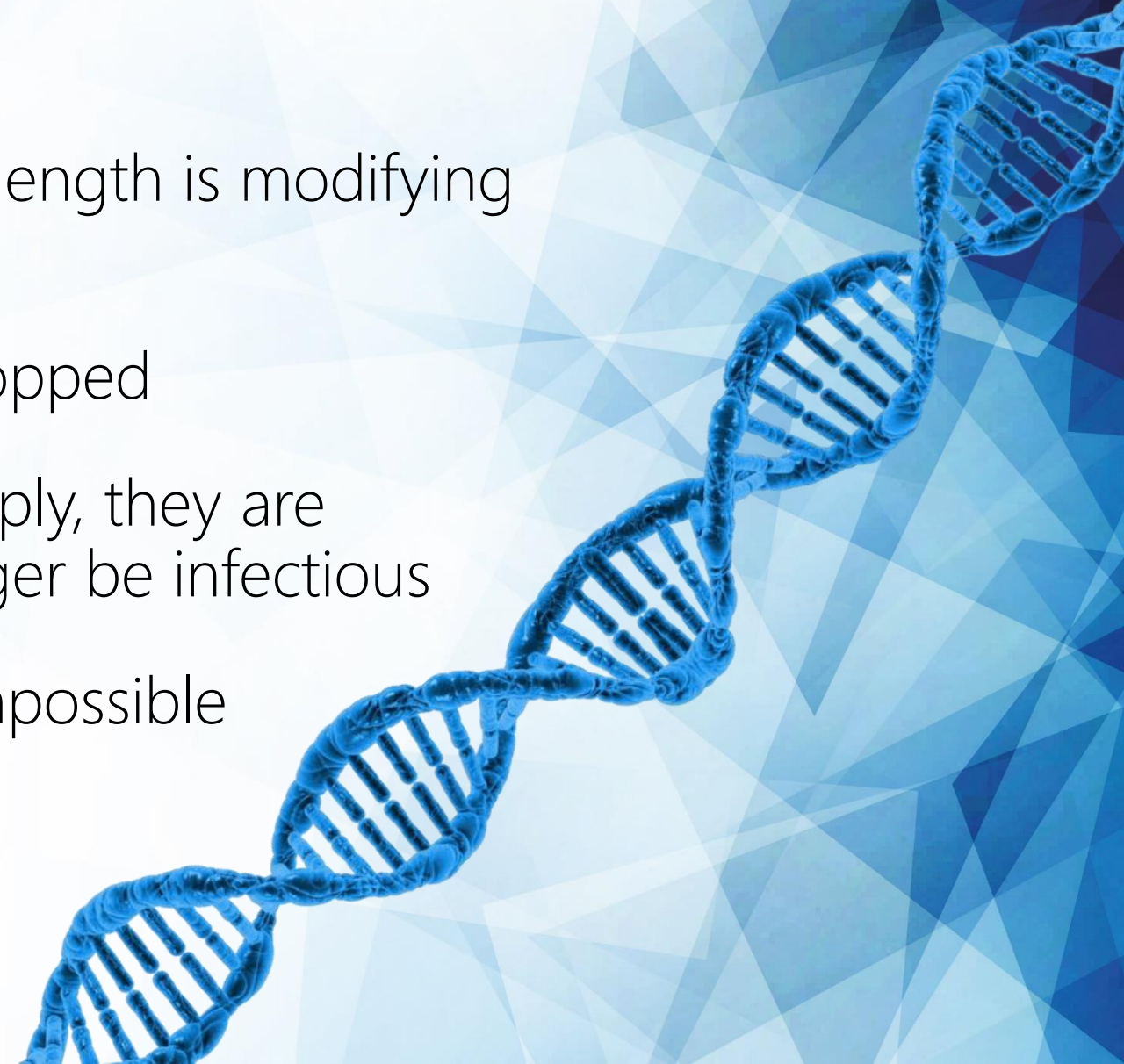
Microorganism	Distance	Radiation dose*	Time
Bacteria			
Escherichia coli	5 cm	9 mWs/cm²	0,74 sec
Legionella pneumophila	5 cm	2,8 mWs/cm²	0,23 sec
Mycobacterium tuberculosis	5 cm	30 mWs/cm²	2,46 sec
Viruses			
Influenza virus	5 cm	10,2 mWs/cm²	0,84 sec
SARS-CoV-2	5 cm	10,6 mWs/cm²	0,80 sec
Mold spores			
Aspergillus niger	5 cm	396 mWs/cm²	32,46 sec

*radiation dose necessary for 90% disinfection / log 1

UV-C disinfection

What is happening?

- The UV-C light with 254nm wavelength is modifying the DNA of microorganisms
- In this way the reproduction is stopped
- If viruses or bacteria cannot multiply, they are considered dead and can no longer be infectious
- Development of a resistance is impossible



Safe for use in crowded rooms

No direct exposure to the UV-C light

- The UV-C light is part of an enclosed system
- The disinfection takes place inside the robust casing
- Therefore, the UV-C devices can be operated absolutely harmlessly when people are in the room
- Furthermore, our products comply with high quality standards

Advantages over devices with a filter

UV-C disinfection works even without expensive filters

- **No dusty filters**
  Devices with filters not only clean the air of viruses, but also draw dust. The filters are quickly clogged with house dust, hair and dirt and have to be changed.
- **No infected filters**
  The filters are infected with viruses, must be professionally replaced on a regular basis and properly disposed of. UV-C light disinfection does not generate any hazardous waste.
- **No loud background noise**
  Disinfection devices with filters require a very powerful fan that works accordingly loudly. With UV-C disinfection there is (depending on the device) a non-disturbing background noise of a maximum of 35db.
- **No costs for new filters**
  The regular but necessary replacement of the filters results in costs that can be saved by using the long-life light sources when using UV-C light for disinfection.

UV-C light

Summary

- Disinfection up to 99.9%
- Elimination of all microorganisms
- Very effective and quick disinfection method
- Chemical free
- Low maintenance and inexpensive

UV-C light is effective against SARS-CoV-2

Studies

UVC irradiation represents a suitable disinfection method for SARS-CoV-2. High viral loads of 5 *106 TCID50/ml SARS-CoV-2 can be inactivated in 9 minutes by UVC irradiation

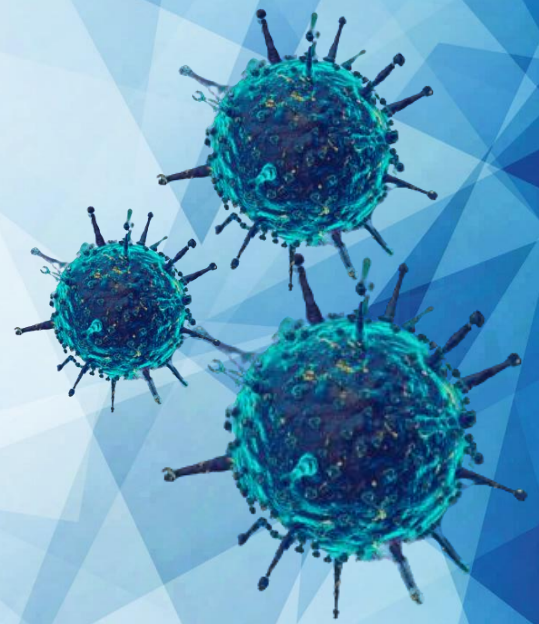
→ Study can be found here Link

SARS coronavirus is likely to be sensitive to irradiation of UV and it is more likely inactivated up to an undetectable level when exposed to irradiation of UV

→ Study can be found here Link

Our study demonstrates that THERAFLEX UV-Platelets (UVC) effectively reduce the infectivity of SARS-CoV, CCHFV and NiV in platelet concentrates and plasma, respectively

→ Study can be found here Link



EVERGEP

MAKING THE WORLD A BETTER PLACE

UV-C solutions

for public transportation

Disinfection of the room air

Air disinfection module

- Specially manufactured UV-C disinfection module, which automatically and continuously disinfects the room air without the use of chemicals
- The disinfection with UV-C light eliminates 99.9% of all microorganisms and is even effective against SARS-CoV-2
- The module is installed in the bus in such a way that the UV-C light can disinfect the air in the bus perfectly, but they do not pose any danger to the passengers!

Specially manufactured UV-C disinfection module

Advantages

- Public transport can be used again without hesitation
- Trust in passengers is strengthened
- The risk of infection is reduced
- People can once again enjoy bus travel and life to the fullest

EVERGEP

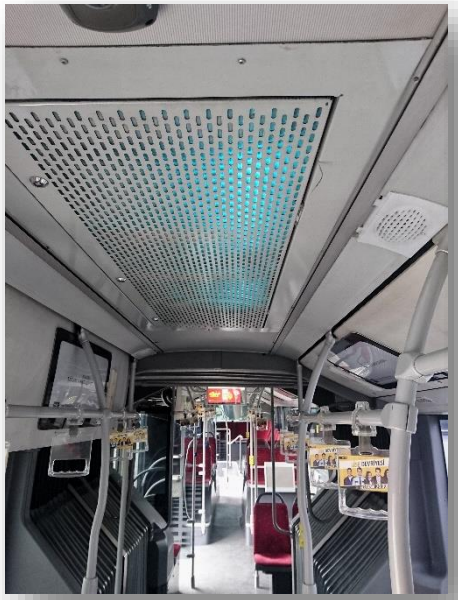
MAKING THE WORLD A BETTER PLACE

Application example

Disinfection module in bus and tram

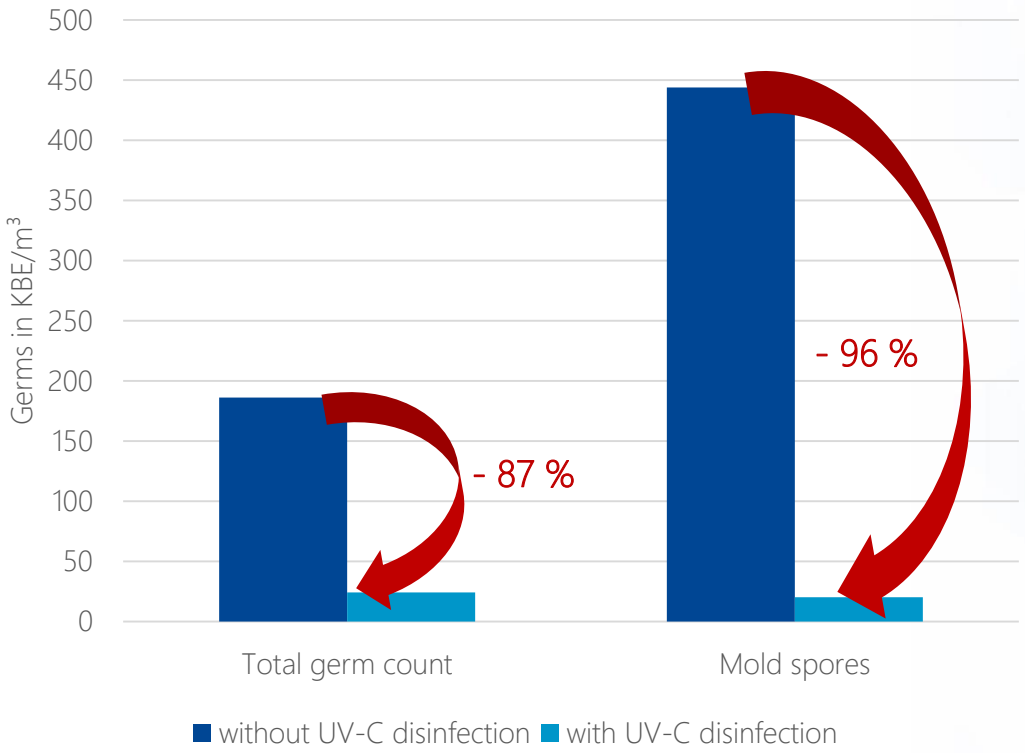
Application in Turkey

In Turkey, buses in Istanbul and the tram in İzmit in the province of Kocaeli are already disinfected with UV-C disinfection modules.

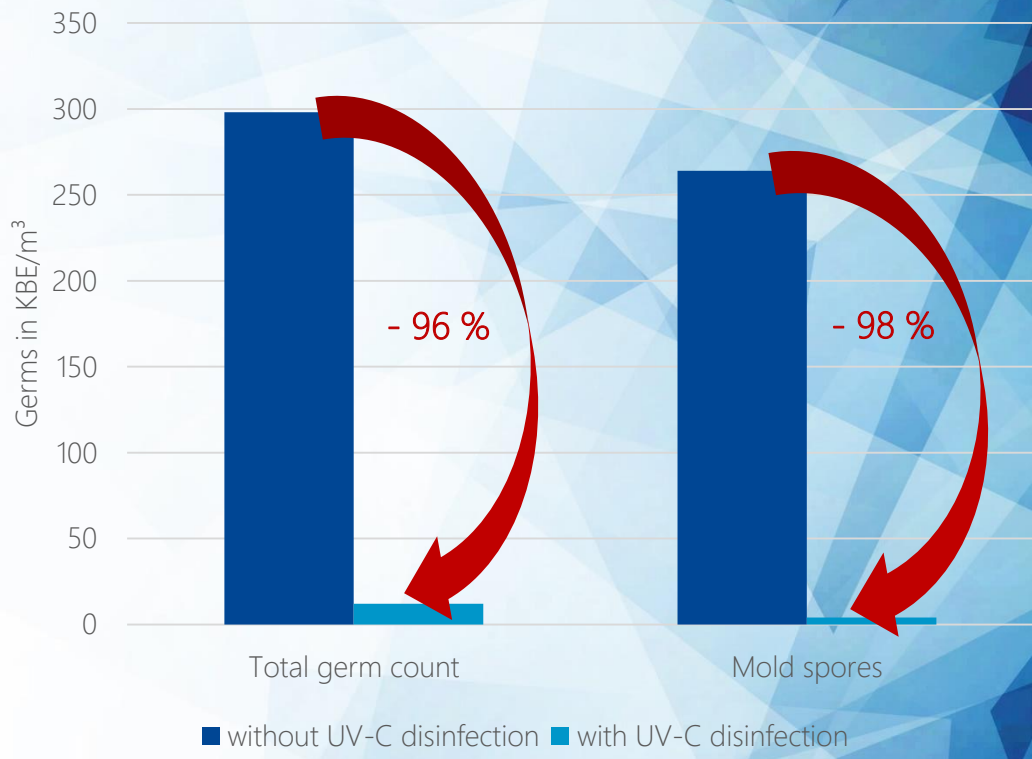


Reduction with UV-C disinfection

UV-C disinfection in the bus

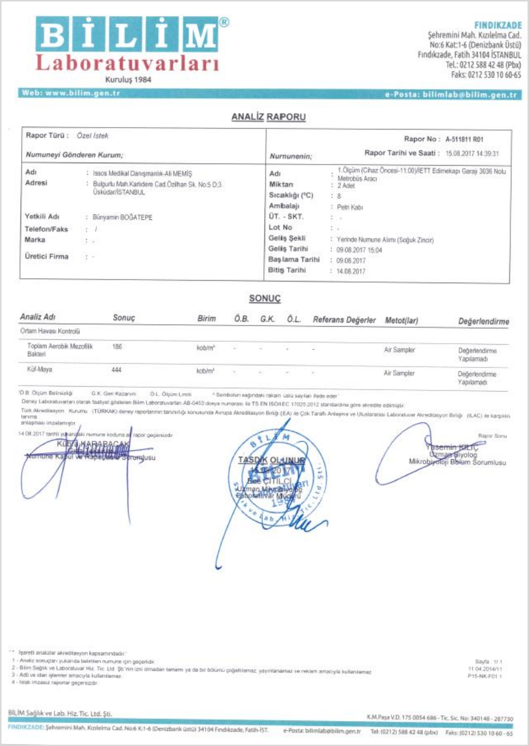


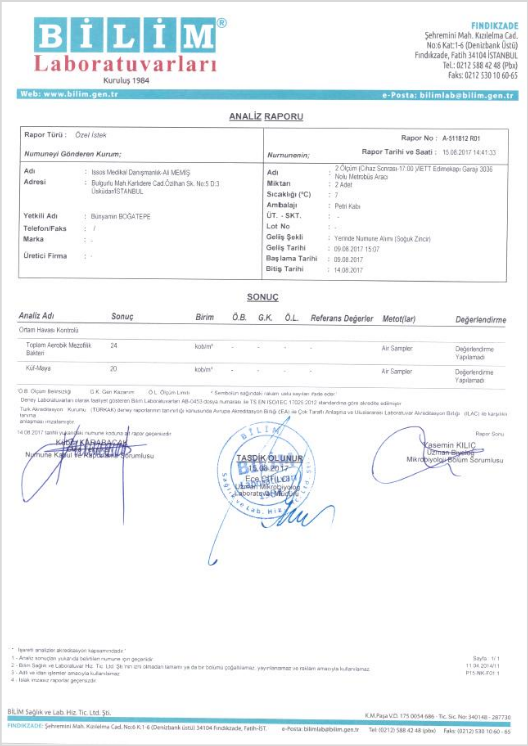
UV-C in the tram



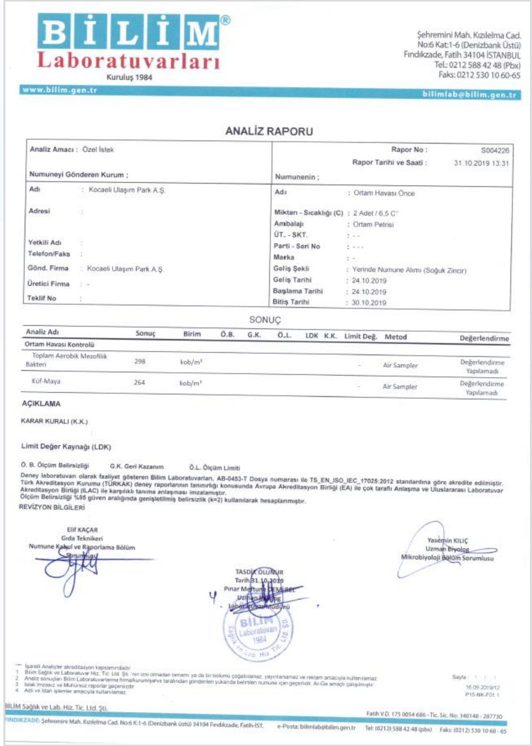
Test report Bilim laboratory

UV-C disinfection in the bus





UV-C in the tram



EVERGEP
MAKING THE WORLD A BETTER PLACE

Thank you for your attention

EVERGEP

MAKING THE WORLD A BETTER PLACE


EVERGEP
MAKING THE WORLD A BETTER PLACE
+357 22 08 08 60
info@evergep.com
www.evergep.com
Diniss