

DISINFECTION LIGHT ENZO



Sophisticated disinfection 405nm light

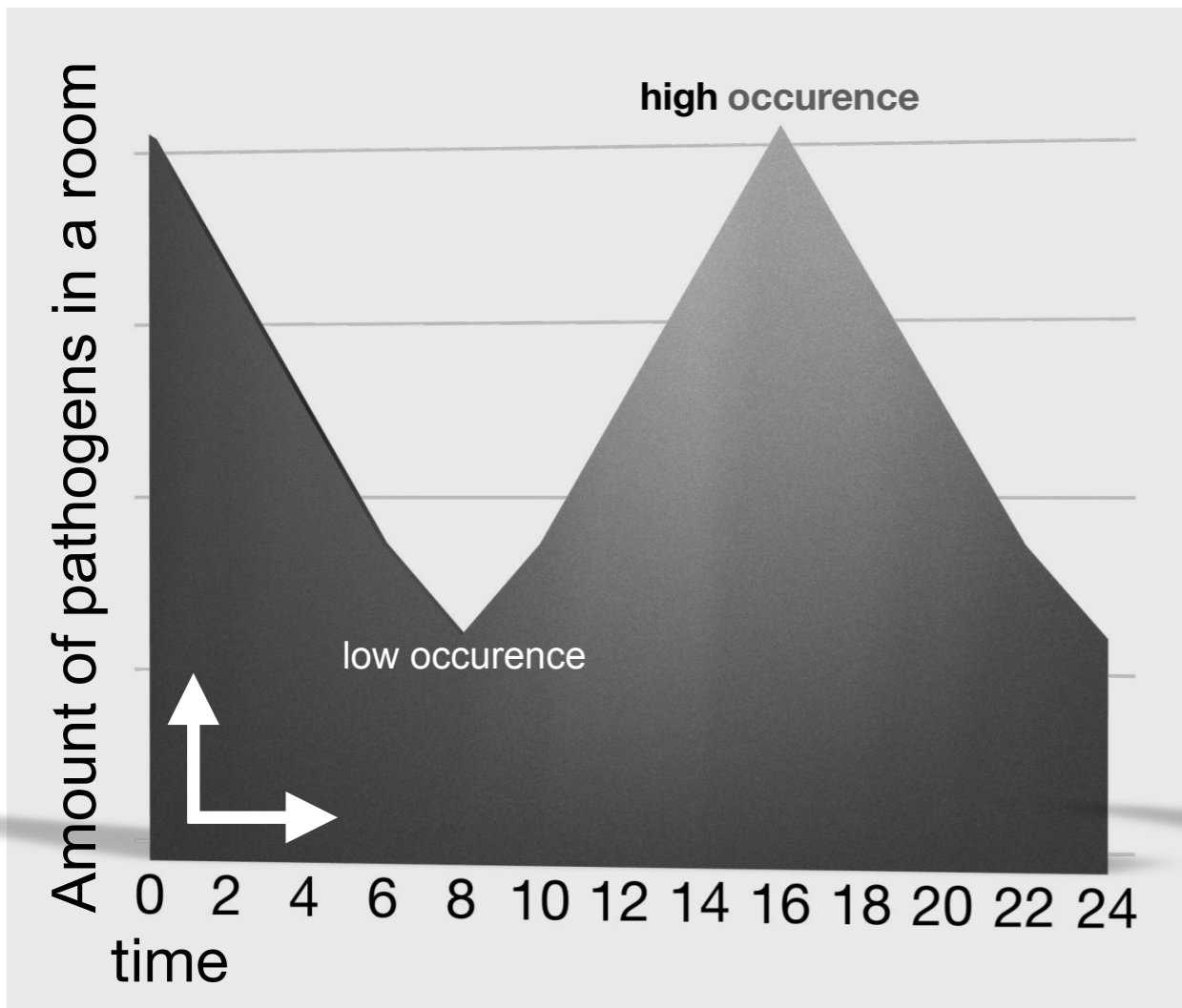


*"The world as we have created it is a process of
our thinking. It cannot be changed without
changing our thinking."*

Albert Einstein

Traditional v. sophisticated disinfection using 405nm light

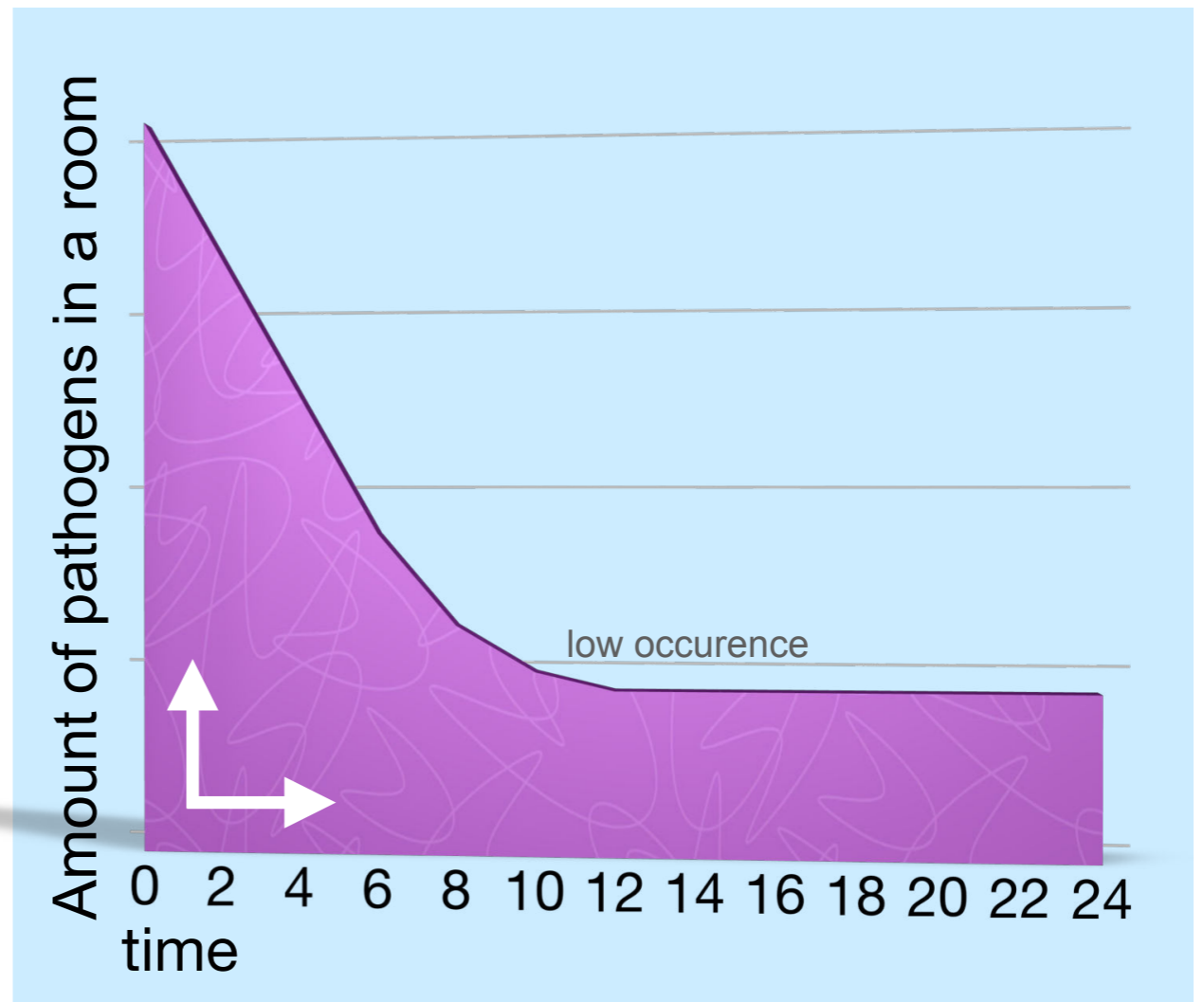
Traditional disinfection



Traditional methods (chemical and UV-C) for decontaminating the whole room are not effective enough. They are toxic to humans and cannot be used in their presence. As a result, premises are disinfected less frequently with the effect lasting much shorter.



Sophisticated disinfection using 405nm light



With the sophisticated disinfection using 405 nm light, you can disinfect rooms continuously, even in the presence of people or animals. The light of the visible spectrum at a wavelength of 405 nm is harmless to the human body. You can disinfect the air and all the surfaces (hard and soft) in the room at once.



How does the sophisticated disinfection using 405nm light work?

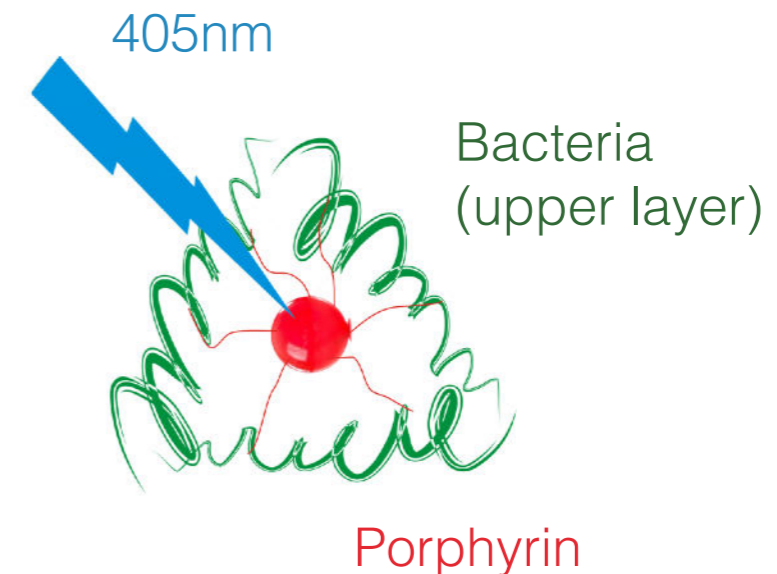
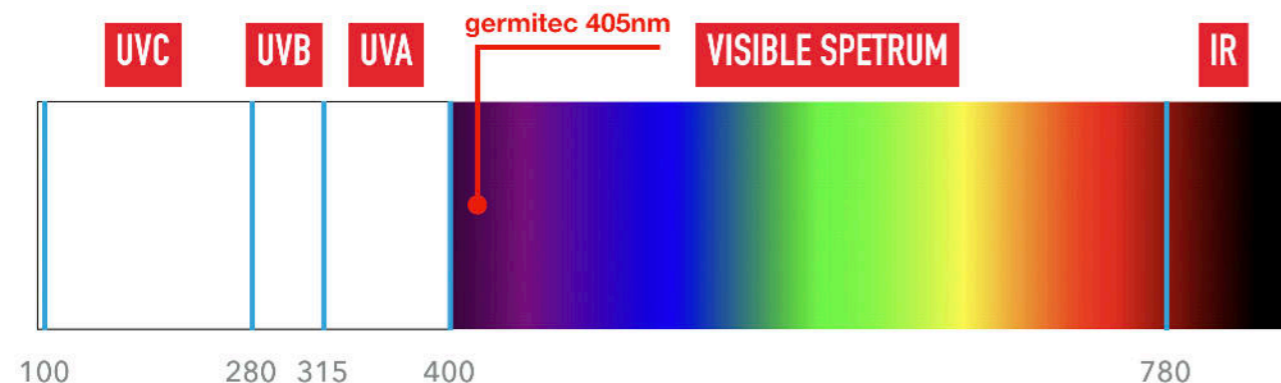
Sophisticated LED disinfection does not use dangerous UV-C radiation. Instead, it uses visible light at a wavelength of 405 nm, which is safe for humans, animals,

pathogens in which they cannot survive and prevents them from repopulating the area. It's similar to removing color stains from laundry in the washing machine using chemicals – oxygen bleaches.

405nm light emitted by Germitec lights penetrates pathogens and interacts with their photosensitive molecules which are commonly found in them (porphyrins). Light-irritated porphyrins (P) form reactive oxygen species (ROS) causing oxidative damage to (and ultimately killing) pathogens (bacteria, viruses, fungi, molds).

plants and does not damage the indoor premises. At 405 nm, the light effectively destroys even pathogens that survive traditional disinfection. At the same time, the light creates a deadly and inhospitable environment for

In this case, however, you use safe, ecological light instead of aggressive chemicals. You do not need any special training to use this disinfection technology.



Inactivation of bacteria through the absorption of visible light

Benefits

Great price



The price for GERMITEC germicidal lights is comparable to disinfection devices with several times

Disinfection that makes sense



With the most advanced 405nm disinfection, you disinfect rooms continuously. The result is several times more efficient than traditional disinfectants.

Safe premises



Pathogens in the air as well as on surfaces (soft and hard) are being continuously neutralized – your premises are safe!

Multiplied efficiency



You create a deadly inhospitable environment for pathogens in which they cannot survive and re-colonize the already disinfected area. You significantly reduce the risk of infection.

Reducing the costs



405 nm light is a safe light of the visible spectrum. You can use it even in the presence of people or animals and thus minimize the downtime and reduce the costs.

Convenient



desinfection

Extremely long service life of the luminaires (quality Czech product) is a guarantee of a trouble-free disinfection for years to come.

Thorough disinfection



405 nm light reflects well from surfaces. That's why even hard-to-reach surfaces where pathogens like to hide (bottom of chair or bed, keyboard, etc.) are thoroughly disinfected.

Only 0,11 EUR/ day



No additional costs! Operating costs for disinfection average at only EUR 0,11 / day.

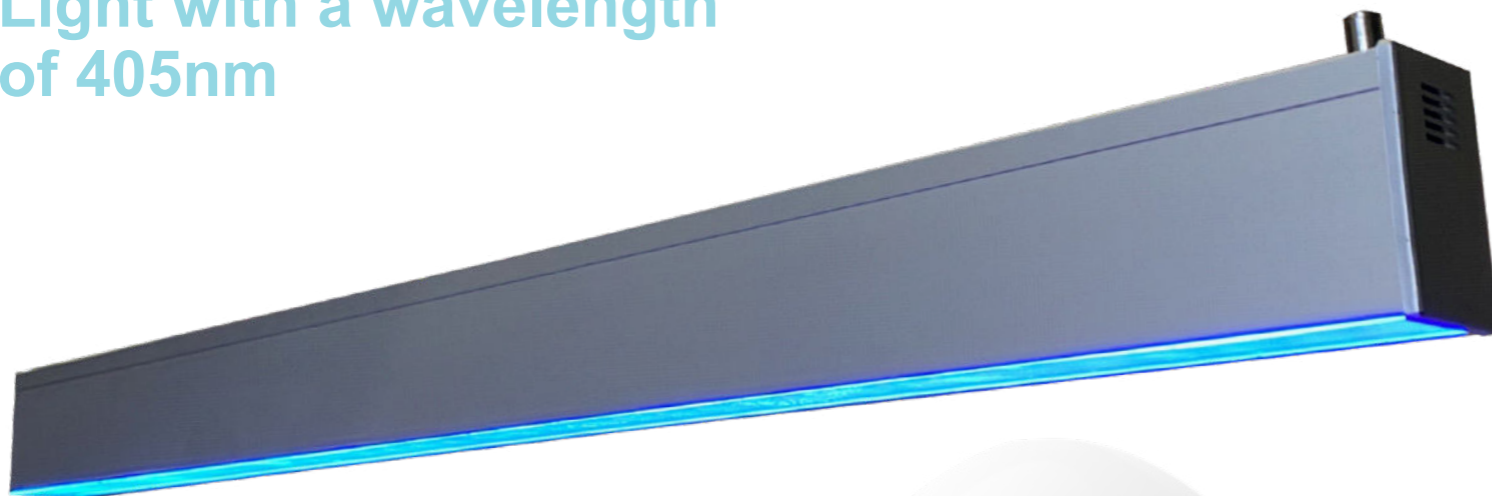
No maintenance



GERMITEC disinfection luminaires are maintenance-free. No additional costs for materials or wages.

Disinfection light ENZO

Light with a wavelength of 405nm



Disinfection technology with high-intensity narrow-spectrum (HINS) light was originally developed for operating theaters in hospitals for their continuous (24/7) decontamination.

In the current circumstances, disinfection of surfaces, work surfaces, aids and air is a core activity in the fight against fatal danger (COVID-19).

GERMITEC lights generating 405nm light were

The light is a unique piece of technology as it continuously disinfects interiors in the presence of people or animals. The light disinfects air and all surfaces (hard and soft) while creating a deadly inhospitable environment for pathogens.

designed and developed to be used in any space without hassle.

The light is mounted directly on the ceiling or on the wall or using adjustable suspension ropes.

LED disinfection technology using 405 nm light is not a fad – it has been tested and verified for years. Visible 405 nm light is "friendly" only to humans, animals and plants. In contact with pathogens (viruses, bacteria, fungi, molds) it acts as a destructive force that kills with oxidation.

Type	LUMI405
Size(mm)	110x80x1000
INPUT (V)	220-230V, 50-60Hz
IP	IP20
Colour	violet
Wavelength	peak 405nm
Germicidal effect	yes
Material	aluminium
Durability	50.000 hr.
Operating temp.	from -20C to 50C
Angle of light	120
Power (Watt)	92
Package content	LED light GERMITEC Suspension system



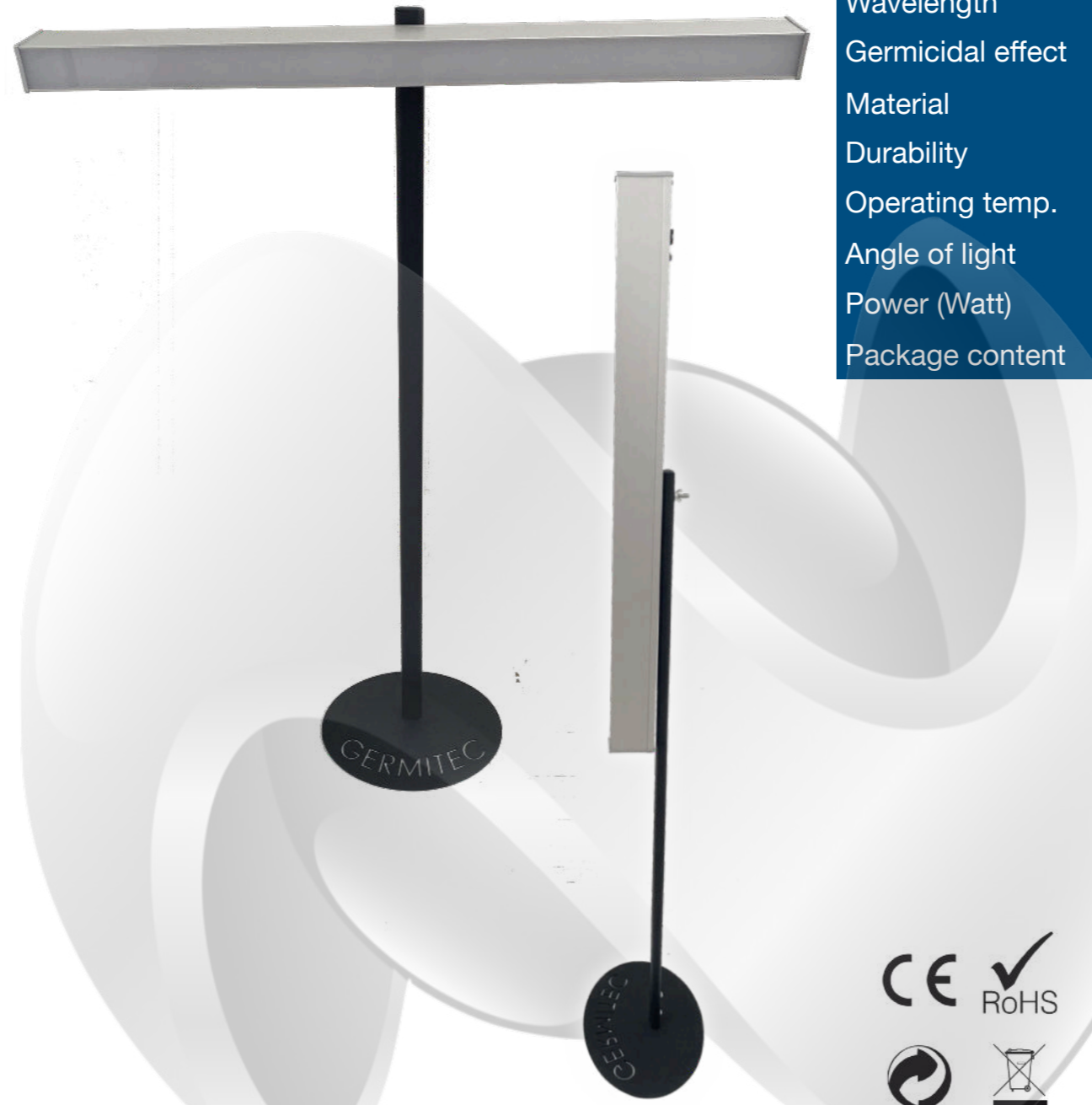
Disinfection light ENZO FLEXI

Light with a wavelength of 405nm

The easily portable LUMI FLEXI light is designed to bring you effective 405 nm light disinfection technology to any space where you live, work, study or play with your children. The light disinfects air, objects and equipment that could expose you to the risk of coming into contact with harmful pathogens.

The light is mounted on the stand (anchored in the middle) for comfortable rotation to a horizontal or vertical position for convenient placing in any space (narrow premises or attic) without hassle.

Whether you are looking for targeted disinfection, effective decontamination of the entire room, or continuous disinfection of several rooms, you will love the portable light for its performance, variability and adaptability.



Type	LUMIFLEXI405
Size(mm)	110x80x1000
INPUT (V)	220-230V, 50-60Hz
IP	IP20
Colour	violet
Wavelength	peak 405nm
Germicidal effect	yes
Material	aluminium
Durability	50.000 hr.
Operating temp.	from -20C to 50C
Angle of light	120
Power (Watt)	92
Package content	LED light GERMITEC with connector C13 cabel 3m stand 1200mm switch



Disinfection light ENZO FLEXI+

Light with a wavelength of 405nm and a photocatalyst

The LUMINANO405 portable light combines the latest two disinfection technologies to increase its efficiency. Disinfection with 405 nm light plus disinfection using a photocatalyst (nanocrystals of TiO₂ semiconductor). The 405 nm light destroys pathogens by shining through the holes in the spotlight and bouncing off the fixed parts of the light's body while activating the TiO₂ nanocrystals on its surface. The light hitting the TiO₂ nanocrystals creates free electrons and electron holes on their surface. Their action, in combination with oxygen, is lethal for pathogens.

The light is popular due to its ingenious design and efficiency. The heat (waste) from the light creates a stream of air that drives pathogens to the photocatalyst. The photocatalyst eliminates not only 99.9% of pathogens in the room, but also dust, soot, odors, smoke and gases.

The TiO₂ concentration is staggering. The surface of the spotlight contains up to 250 m² of usable area of nanocrystals.



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Size(mm)	110x80x1000
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IP	IP20
Colour	violet
Wavelength	peak 405nm
Germicidal effect	yes
Material	aluminium
Durability	50.000 hr.
Operating temp.	from -20C to 50C
Angle of light	120
Power (Watt)	92
Package content	LED light GERMITEC with connector C13 cabel 3m stand 1200mm with nano coat switch

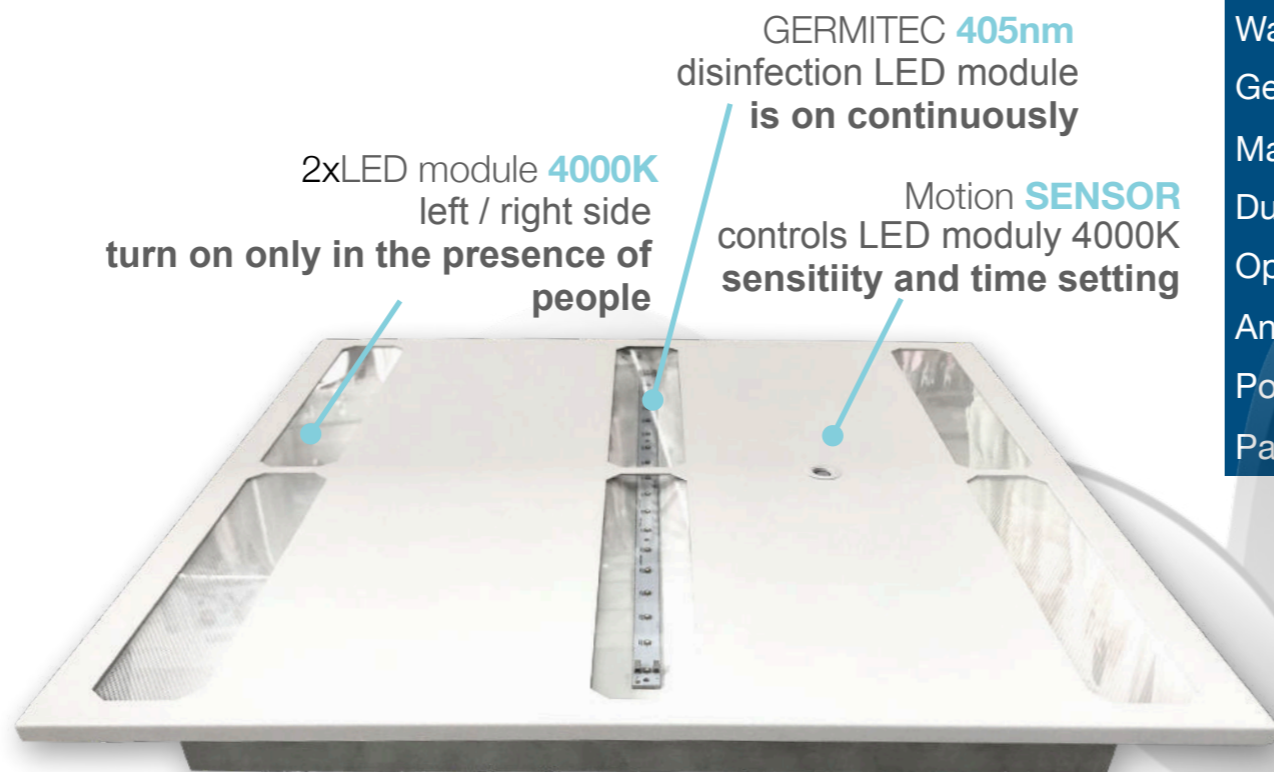


Disinfection light ENZO PANEL

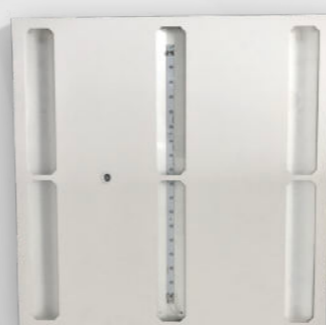
Light with a wavelength of 405nm and 4000K module

Ceiling LED panel in the size 595 x 595 combines two classic LED modules with a chromaticity of 4000K and one disinfection module with a wavelength of 405nm, which is permanently on. The light has an integrated motion sensor that activates 2 side LED modules when motion is detected. The adjustable functions of the motion sensor include the switching time of the classic LED modules and the level of sensitivity to light. LED panel 595x295 contains only disinfection LED module.

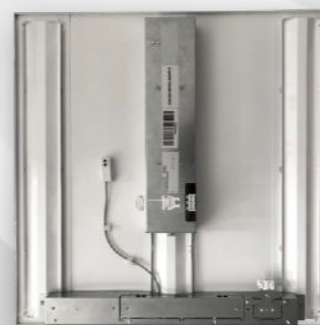
Almost unnoticeable yet effective disinfection designed for coffered ceilings



595x295



595x595



Type	LUMIPANEL405
Size(mm)	595x595 / 595x295
INPUT (V)	220-230V, 50-60Hz
IP	IP20
Colour	violet
Wavelength	peak 405nm
Germicidal effect	yes
Material	aluminium
Durability	50.000 hr.
Operating temp.	From -20C to 50C
Angle of light	120
Power (Watt)	405nm-34W, 2x4000K-35W
Package content	LED panel



GERMITEC LIGHT - CONFIRMED EFFICIENCY

- ✓ CE certified
- ✓ meets the standard ČSN EN 62471
- ✓ does not fall into the area of harmful UV radiation
- ✓ has no pathogenic effect on humans
- ✓ reviewed by SUKL
- ✓ measurement protocol from the Czech Metrology Institute
- ✓ measurement results - Masaryk University Brno

DECLARATION OF CONFORMITY

VYRTYCH
Centrum vývojových a zkušebních laboratorí

PROTOKOL O ZKOUŠCE

Číslo protokolu: 06-35-2020
Datum vydání: 24. 9. 2020
Název výrobku: Stacionární svítidlo
Typ výrobku: ENZO 88W série VOTICE88
Jmenovité hodnoty: 230 V, 50 Hz
Zadavatel/Zákazník: Laborator pro vývoj a realizaci, Česká výrobní technická, Fakulta elektrotechnická, Technická 2, 190 27 Praha 6
Výrobek: Germitec s.r.o., Křenova 439/15, Víteňská 162, 00 Praha 6
Objemníka: email ze dne 20. 8. 2020
Počet zkoušených vzorků: 1 ks, ENZO 88W série VOTICE88
Vzorky předloženy: 14. 9. 2020
Datum provedení zkoušek: 17. - 21. 9. 2020
Místo provedení zkoušek: Centrum vývojových a zkušebních laboratorí, Brno 317, 294 06 Brno
Provedení zkoušky: Fyziologická bezpečnost světelných zdrojů a soustav světelných zdrojů ČSN EN 62471
Výrobek zkoušen podle: ČSN EN 62471
Doplnění, odchylky nebo vyloučení z metod: Zkoušky mimo rozsah akreditace
Výsledky zkoušek uvedené v protokolu se týkají pouze zadaného vzorku, ak by byly.
Hodnoty v tomto protokolu jsou měřeny s přesností předepsanou ve zkoušebním předpisu.
Bez písemného souhlasu laboratoru nesmí být protokol reprodukován ani neúplně.

Zkoušky provedl a ošetřil:
Ing. Tomáš Jirák
Vedoucí laboratoru

PROTOKOL - ČSN EN 62471

PROHLÁŠENÍ O SHODĚ
Dle Evropské směrnice CE-EMC 2004/108/EC

Germi-tec

Prohlášíme, že u uvedeného výrobku byla posouzena shoda vlastností a technických požadavků výrobku stanovenými zákonem č. 22/1997 Sb. v platném znění a technickým předpisem. Potvrzujeme, že vlastnosti zařízení splňují požadavky dle níže uvedených nařízení vlády a že výrobek je - za podmínek obvyklých a v technické dokumentaci určených - bezpečný a jsou přijata opatření pro zabezpečení shody všech výrobků uvedeného typu s technickou dokumentací.

Výrobce: Germitec s.r.o., Křenova 439/15, 162 00, Praha 6
Druh výrobku: LED liniové dezinfekční osvětlení

Název modelu: ENZO 405NM 50.30C, ENZO 405NM 50.35C, ENZO 405NM 50.40C, ENZO 405NM 50.45C, ENZO 405NM 100.60C, ENZO 405NM 100.80C

Popis výrobku: LED liniové, závěsné/přisazené osvětlení určené k dezinfekci. Vlnová délka světla 405nm, FLEXI - příslušenství stojan

Nařízení vlády: Uvedený výrobek je ve shodě s nařízením vlády 117/2016 dle níže uvedených norem:

Nařízení vlády č. 118/2016 Sb.
Nařízení vlády č. 117/2016 Sb.
Nařízení vlády č. 481/2012 Sb.

ČSN EN 55015:2013
ČSN EN 55022 ED 3
ČSN EN 61000-3-2 ED 3
ČSN EN 61547 ED 2
ČSN EN 60598-1
ČSN EN 60598-2-1:1997

Dle výrobce: Na základě prohlášení o shodě vydaného výrobcem, odpovídá zařízení výše zmíněným normám.

Prohlášení o shodě bylo vydáno dne: 23.07. 2020 v Praze
za společnost GERMITEC s.r.o.

CE

GERMITEC
Fiala Daniel (jednatel společnosti)

PROTOKOL O MĚŘENÍ 8018-PT-R0006-19 List 2 ze 3 listů

Podmínky prostředí: Teplota v laboratoru (23 ±2) °C

Podmínky měření: Měření spektrální charakteristik zářivkami dodaného zdroje bylo provedeno etalonovým UV a VIS spektrometrem. Před měřením spektra byl UV zdroj zapnut a temperován po dobu 30 min (v 1 min po zapnutí bylo maximum spektrálního výkonu na úrovní 0,5 mm keramikové difúze). Bylo provedeno několik měření v různých místech zdroje (pod jiným LED segmentem) v konstantní vzdálenosti 60 cm od krycího skla svítidla. Výsledné spektrum je průměrem těchto měření.

Výsledky měření: Spektrální rozdíl měřeného zdroje zřetelně je patrný z přiložených grafů. Odchytky maximálního spektrálního výkonu v různých místech zdroje nebyly větší jak 0,5 nm. Průměrný výkon vyzařovaný v pásmu 250 nm - 400 nm a 400 nm - 500 nm je patrný z tabulky. Průměrná hodnota maxima výkonu je uvedena níže.

Tab. č.1: Poměr výkonu vyzařovaného v pásmu 250 nm - 400 nm a 400 nm - 500 nm.

Spektrální pásmo (nm)	Výkon (%)
250 - 400	32
400 - 500	68

Nejvyšší intenzita záření měřeného zdroje byla na vlnové délce 403,8 nm a sejasnotou (U_v = 1 nm).

Snímek č.1: Relativní spektrum LED zdroje

MI

PROTOKOL Z ČESKÉHO METROLOGICKÉHO INSTITUTU

MI Český metrologický institut
Článek 31, 638 00 Brno
tel: +420 545 558 111
www.cmi.cz

PROTOKOL O MĚŘENÍ
8018-PT-R0006-19 List 1 ze 3 listů

Datum vydání: 20. listopadu 2019
Zákazník: Dream-Tec s.r.o., Žitkova tř. 309/12, 370 01 České Budějovice

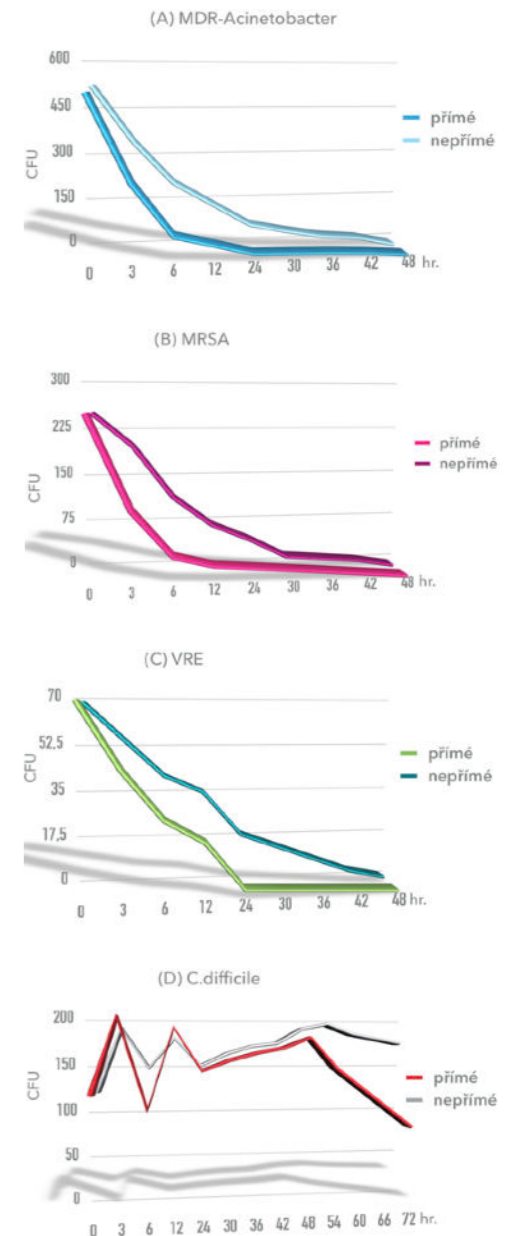
Předmět měření: zdroj záření
Měřené zařízení - druh: LED zdroj modelové svítidla
výrobce: Dream-Tec s.r.o.
typ: -
výrobní číslo: 0001
specifikace: Měření spektrální charakteristik
Použitý etalon: Etalonový UV spektrometr (200-430 nm) nm, certifikát č. 9018-KL-P0028-19
Etalonový VIS spektrometr (350-1000 nm) nm, certifikát č. 8018-KL-P0027-19

Datum provedení: 19. listopadu 2019
Místo provedení: Laborator CMI-PM

Měření provedl: Vedoucí oddělení: Dr. Ing. Marek Šmíd

Mgr. Petr Matyášek
Ing. Ilsestev Čvaněk

LIFE CYCLE MEASUREMENT: MDR-ACINETOBACTER, MRSA, VRE, C.DIFFICILE





Subject: antimicrobial effect of light at a wavelength of 405 nm - repetition of 2 cultures

Dear Mr. Director,

we retested two pathogenic bacteria (*Escherichia coli*, CCM 3954 and *Salmonella enteritidis*, CCM 7189) for sensitivity or resistance to 405 nm light by GERMITEC with **diffuser removed**, and in contrast to previous tests, **bowls were exposed to light without being covered** (or without a lid).

Testing showed that after 24 h. exposure to GERMITEC light the number of viable cells (see enclosed protocols) fell significantly and therefore I **confirm** GERMITEC light inhibited the growth of the above-mentioned microorganisms for 24 hours.

Yours sincerely,

Prof. RNDr. Ivo Sedlacek, CSc.
Head of CCM

MASARYKOVA UNIVERZITA
Prf odovedecka faku I ta
4010 USTAV EXPERIMENTALNI BIOLOGIE

Subject: a statement on the antibacterial effect of light at 405 nm on staphylococci

Based on the tests in accordance order no. 2013098 (Tron Elektronicke součástky s.r.o.) I **hereby confirm** the GERMITEC light with a light wavelength of 405 nm has the **inhibitory effect** against the reference strains of **staphylococci**:

Staphylococcus aureus susp. *aureus* CCM 4516

- inoculum (blank) with a density of 59 CFU at 10⁻⁵ dilution (default: 1.McF)
- after 24 h exposure **a reduction down to 6 CFU** at 10⁻⁵ dilution (default: 1.McF)

Staphylococcus aureus susp. *aureus* CCM 4750 (=MRSA family)

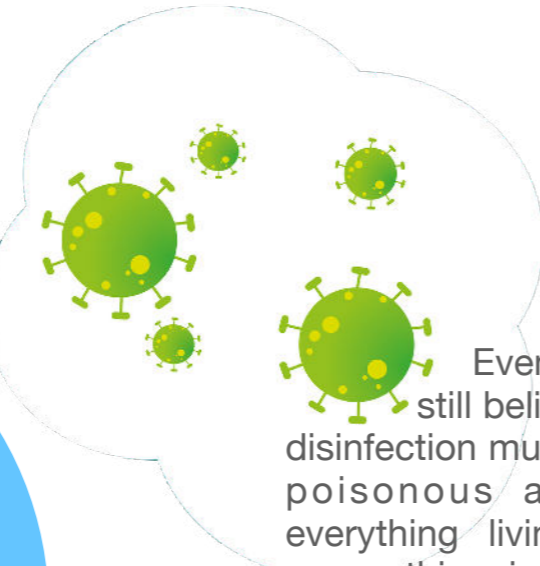
- inoculum (blank) with a density of 128 CFU at 10⁻⁵ dilution (default: 1.McF)
- after 24 h exposure **a reduction down to 12 CFU** at 10⁻⁵ dilution (default: 1.McF)

Conclusion

The GERMITEC light unambiguously **suppresses** the multiplication and growth of reference strains of staphylococci, when after 24 hours of exposure to light at a distance of 1 m, approximately **9/10** of the cells used for testing were **inhibited**.

Prof. RNDr. Ivo Sedlacek, CSc.
Head of CCM

MASARYKOVA UNIVERZITA
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4010 USTAV EXPERIMENTALNI BIOLOGIE
61137 Bm@Kotlarska 2



Even today, many still believe that effective disinfection must be aggressive, poisonous and deadly to everything living. We love to prove this view wrong. When disinfecting rooms, the toxicity of traditional disinfection methods (chemical and UV-C radiation) is the reason why they do not have a significant and long-lasting effect. Due to their toxicity, they cannot be used in the presence of persons and therefore their effect is very short-lived.

Unlike traditional disinfection methods, **GERMITEC** lights do not use toxic "brute force." Instead, they opt for smart and sophisticated solutions. Our lights are currently the only effective technology for disinfection of rooms (air and surfaces) in the presence of people or animals.

Compared to traditional methods, our lights reduce the risk of pathogens spreading more significantly.



GHC GENETICS

FAKULTNÍ
NEMOCNICE
U SV. ANNY
V BRNĚ



CITROËN

**MANUFACTURER:**

Germitec s.r.o.
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Praha 6
Czechia

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info@ledhouse.sk

WHOLESALE:

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034 01 Ružomberok tel.: +421 908
088 100 e-mail: shop@kasteling.sk

