

**Transforming indoor  
lighting into sanitising  
solutions for all  
places we work, play  
and travel**



# Coronavirus can stay suspended for +4 hrs

Can't See  
where it is



Can't Track  
where it's moving



Can't Predict  
how it will mutate



Can't Lockdown  
society forever



Victorian study has demonstrated the **risk of aerosolised particles** in a matter of seconds



Aerosol distribution at 60 seconds after coughing in a hospital room. Source: Supplied



Aerosol distribution at 120 seconds after coughing in a hospital room. Source: Supplied

# Higher risk industries

It's become critically important to improve hygiene maintenance and Industries are investing to upgrade their processes but there are higher risk individuals in the community

## Restaurants & Cafes

Food germ contamination impacts 4.1 million Australians each year

## Offices

Need to increase confidence in hygienic workplaces as organisations call staff back into offices

## Schools Childcare

Social distancing and self hygiene has been unachievable with kids in classrooms

## Hotels

Hotel ventilation risks have been revealed due to airborne germs

## Hospitals

1 in 10 patients acquire a new infection during short term stays in hospitals

## Airports

Domestic and international borders imminent to return causing high demand for outbreak containment

## Shopping Centres

Retailers looking to make up for lost business, so hygiene preparation is critical to drive customers

## Aged Care

92% of covid-related deaths in Australia were 60+

# Let there be light.

Hygiene Unlimited Group (HUG) products **rely on light** to disinfect **continuously**, covering a wider scale of surfaces and space in indoor environments. HUG disinfection offer **smarter, safer and greener** solutions to help fight the invisible war against harmful microorganisms which cause disease and deaths.



**Can't See** → covers 100% areas light touches



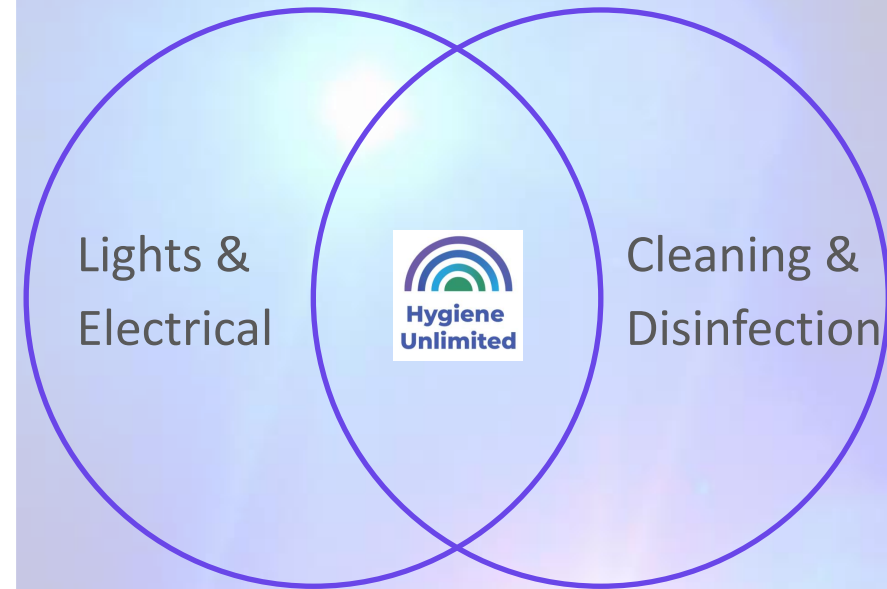
**Can't Track** → continuous 24hr solution



**Can't Predict** → tested effectiveness, cost-friendly



**Can't Lockdown** → high-risk industry product-fit



# HUG Clean Edge

## 405nm Disinfectant LED Light

World's first  
**2in1**  
disinfectant  
panel light

Sanitisation  
**+99%**  
certified

Highest grade  
**IEC62471**  
Human safety

New  
**24/7**  
sanitisation

Clean Edge is a new class of antimicrobial light technology which safely sanitises space and surfaces while continuing to provide lighting.

405nm is an LED light that uses high energy visible light to sanitise bacteria, germs and viruses in the space it covers by combining standard LED lighting with a unique patented antibacterial 405nm wavelength with disinfecting power.

405nm is harmless to the human body and received the lowest risk rating for the IEC62471 standard and is now available to help protect our everyday living and working places.

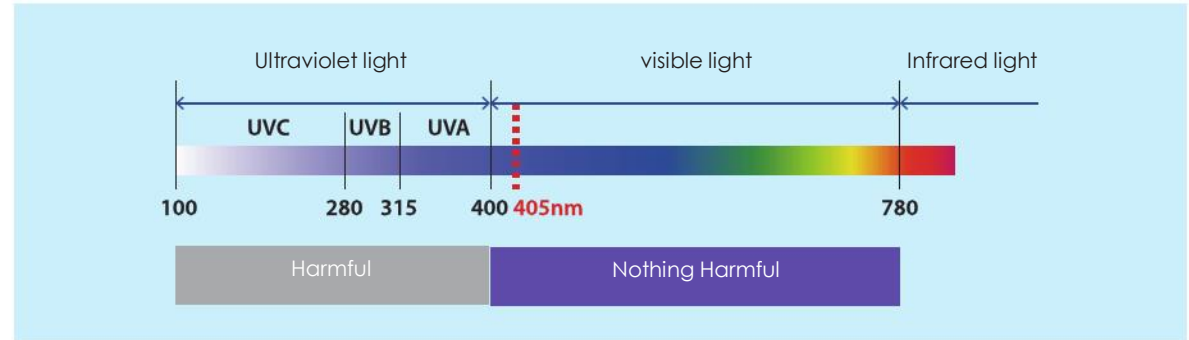


**Each light  
covers 25m<sup>2</sup> area**

# What is 405nm?



## 405nm is a wavelength of light



### ■ Sterilization Methods by Wavelength Comparison

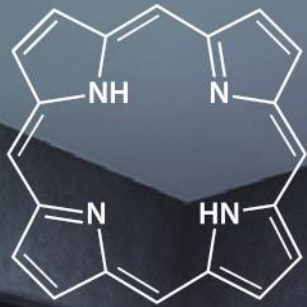
COMPARISON	UVC	CLEANEDGE 405NM
Disinfecting Methodology	Direct sterilisation through DNA damage	Porphyrin Reaction Decomposition
Disinfection Timing	Short and periodic	Continuous
Usage Method	Areas must be clear of people, pets and plants	Ok for public and private areas whilst occupied too
Safe for Human Exposure	No - Harmful (can cause cancer, cataracts, etc.)	Yes - Met no risk category for IEC62471
Investment	Expensive and high maintenance due to cautions	One time installation, no ongoing maintenance & costs

Well-known germicidal lights with UV-C, UV-B, UV-A is not suitable for daily living spaces because it has harmful wavelength to human body that can cause damage to human tissues.

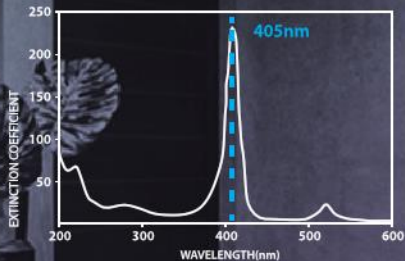
For everyday lighting, it is more important to sanitise safely than quickly. CLEAN EDGE uses a 405nm light source with a wavelength of light that exists in the visible light (natural light), so you can use it for a long time in everyday life.

# How does 405nm work?

## PORPHYRIN



Porphyrin is bacteria reacts in 405nm



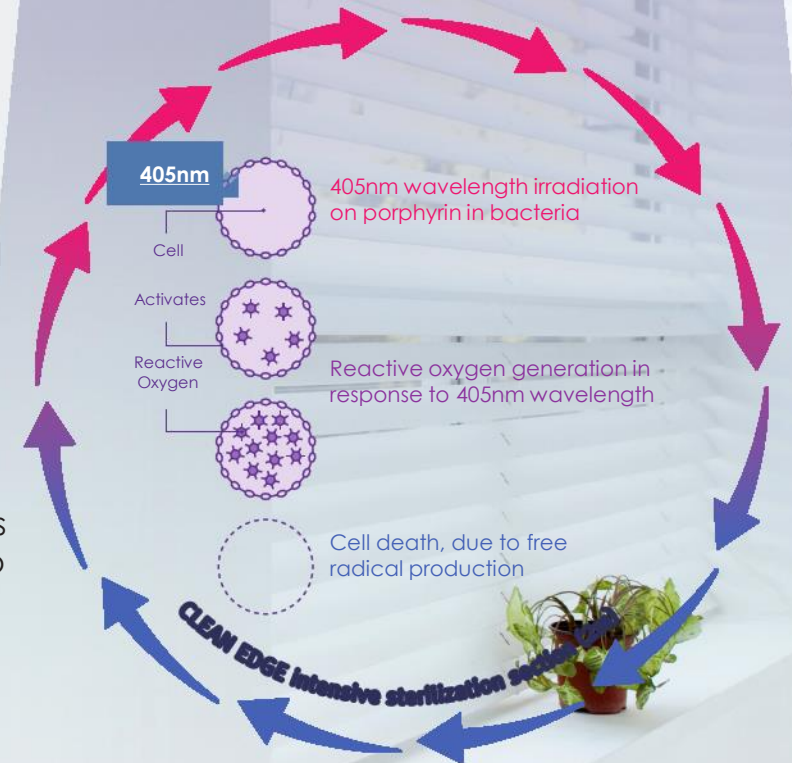
source : A journal published by Johnson Matthey Plc.



## How 405nm disinfects

Unlike UV (ultraviolet) light that directly destroys microorganisms, the 405nm light ray targets naturally occurring compounds called porphyrins.

These porphyrins produce Reactive Oxygen Species (ROS) in the cells which inactivates the microorganisms and prevents re-population or spreading to other areas or surfaces.



Through the convection of air in the indoor space, it passes through the 405nm intensive sterilization section taking care of the entire space, such as air, people's clothes, and the surface of things.

# Is 405nm new?

No, Clean Edge has leveraged decades of research to create a light which has never been more relevant to our society today

Date	Subject	Link
Sep-21	Pulsed blue light inactivates two strains of human coronavirus	<a href="https://www.sciencedirect.com/science/article/pii/S1011134421001615">https://www.sciencedirect.com/science/article/pii/S1011134421001615</a>
May-21	Antimicrobial visible LED light is confirmed to deactivate viruses including SARS-CoV-2	<a href="https://www.ledsmagazine.com/lighting-health-wellbeing/article/14203380/antimicrobial-visible-led-light-is-confirmed-to-deactivate-viruses-including-sarscov2">https://www.ledsmagazine.com/lighting-health-wellbeing/article/14203380/antimicrobial-visible-led-light-is-confirmed-to-deactivate-viruses-including-sarscov2</a>
Apr-21	The virucidal effects of 405 nm visible light on SARS-CoV-2 and influenza A virus	<a href="https://www.biorxiv.org/content/10.1101/2021.03.14.435337v2.full.pdf">https://www.biorxiv.org/content/10.1101/2021.03.14.435337v2.full.pdf</a>
Dec-20	Inactivation of Bacterial Pathogens following Exposure to Light from a 405-Nanometer	<a href="https://journals.asm.org/doi/10.1128/aem.01892-08?permanently=true&amp;">https://journals.asm.org/doi/10.1128/aem.01892-08?permanently=true&amp;</a>
Nov-20	Light-based technologies for management of COVID-19 pandemic crisis	<a href="https://www.sciencedirect.com/science/article/pii/S1011134420304498">https://www.sciencedirect.com/science/article/pii/S1011134420304498</a>
Oct-20	The Disinfection Efficacy of 405 nm Light	<a href="https://uvsolutionsmag.com/articles/2020/the-disinfection-efficacy-of-405-nm-light/">https://uvsolutionsmag.com/articles/2020/the-disinfection-efficacy-of-405-nm-light/</a>
Jan-20	Non-ionizing 405 nm Light as a Potential Bactericidal Technology for Platelet Safety	<a href="https://www.frontiersin.org/articles/10.3389/fmed.2019.00331/full">https://www.frontiersin.org/articles/10.3389/fmed.2019.00331/full</a>
Feb-18	Efficacy of antimicrobial 405 nm blue-light for inactivation of airborne bacteria	<a href="https://www.spiedigitallibrary.org/conference-proceedings-of-spie/10479/104791G/Efficacy-of-antimicrobial-405-nm-blue-light-for-inactivation-of/10.1117/12.2289987.short?SSO=1">https://www.spiedigitallibrary.org/conference-proceedings-of-spie/10479/104791G/Efficacy-of-antimicrobial-405-nm-blue-light-for-inactivation-of/10.1117/12.2289987.short?SSO=1</a>
Feb-18	Antimicrobial blue light inactivation of Neisseria gonorrhoeae	<a href="https://ui.adsabs.harvard.edu/abs/2018SPIE10479E..00W/abstract">https://ui.adsabs.harvard.edu/abs/2018SPIE10479E..00W/abstract</a>
Sep-17	Antimicrobial 405 nm light for clinical decontamination - Hospitals	<a href="https://pureportal.strath.ac.uk/en/studentTheses/antimicrobial-405-nm-light-for-clinical-decontamination-investiga">https://pureportal.strath.ac.uk/en/studentTheses/antimicrobial-405-nm-light-for-clinical-decontamination-investiga</a>
Sep-14	405 nm light technology for the inactivation of pathogens and its potential role for environmental disinfection and infection control	<a href="https://pubmed.ncbi.nlm.nih.gov/25066049/">https://pubmed.ncbi.nlm.nih.gov/25066049/</a>

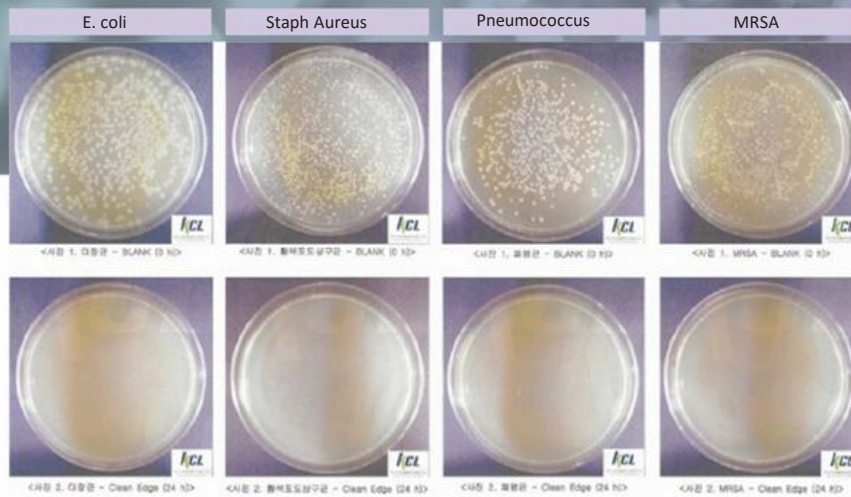
Over 20 additional research papers in link below

<https://worldwidescience.org/topicpages/h/high-intensity+405-nm+light.html>



# Australian Lab tested to reduced coronavirus down to 0.08% in 4 hrs

Clean Edge has been tested at over 8 laboratories globally to significantly reduce common bacteria, virus and germs that impact our homes, hospitals, hotels, schools, gyms and all places we live, work and travel.



**intertek**  
Total Quality. Assured.

**Intertek Testing Lab**

Staphylococcus aureus +76% in 30 mins, +89% in 3hrs, +98% in 9hrs, +99.9% in 24hrs



**Korea Construction Living**

**Environment Research Institute**

E. coli / Staphylococcus aureus / Pneumococcus / MRSA were reduced by over 99.9% within 24 hrs



Hygiene Unlimited takes claims about coronavirus seriously and do no claim Clean Edge will cure someone who had covid. However the testing shows Clean Edge can effectively kill the coronavirus as per parameters below, and can be safely and continuously used in our everyday rooms.








In May 2021 Clean Edge was tested at Eurofins, a leading accredited laboratory in Australia. A surrogate virus which is approved for testing for coronavirus as per the safe guidelines from the TGA was tested at a distance of 2m and for 4 hours which reduced the virus by 99.92%.



In addition to Australia, Clean Edge reduced coronavirus by 99.89 % at Nara Medical University, and 99.16% at KR Biotech

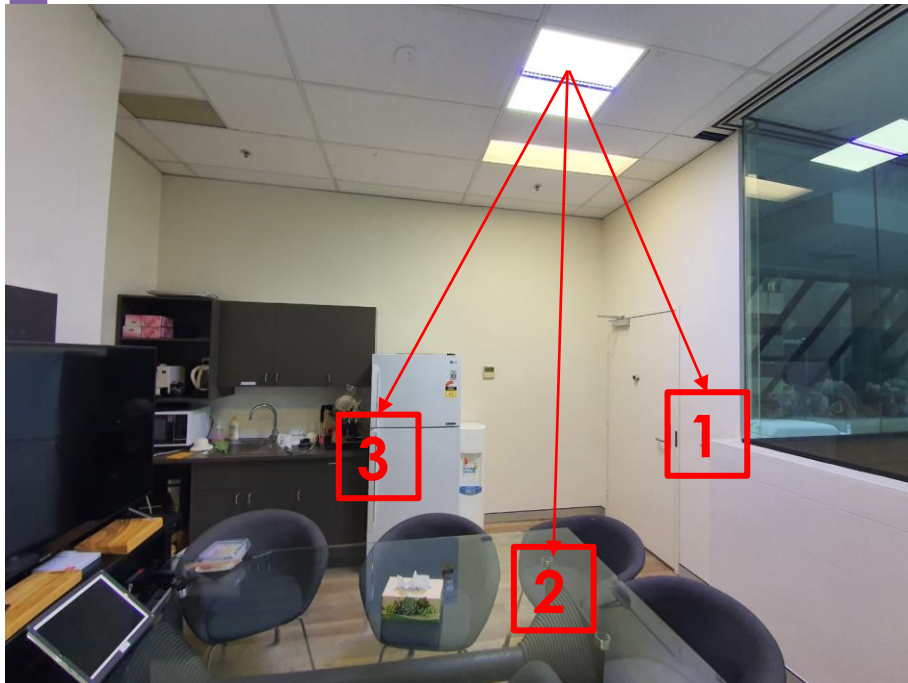
# Successfully tested to reduce bacteria, virus and germs across accredited labs globally.

Test Laboratory	Test Organisms	Test Conditions	Test Result
<b>Eurofins ams Laboratories Pty Ltd</b> 	MHV-1 (Surrogate virus for coronavirus as per TGA guidelines for disinfectant efficacy tests on for coronavirus)	<ul style="list-style-type: none"> <li>- 2 meters from 405nm light</li> <li>- 4hrs, 24hrs exposure</li> </ul>	<ul style="list-style-type: none"> <li>- <b>99.92% reduction after 4hrs</b></li> <li>- <b>96.20% reduction after 24hrs due to the natural death in control carrier</b></li> </ul>
<b>Intertek Testing Services Singapore Pte Ltd</b> 	Staphylococcus aureus ATCC 6538	<ul style="list-style-type: none"> <li>- 2 meters from 405nm light</li> <li>- 30min, 3hrs, 9hrs, 24hrs exposure</li> </ul>	<ul style="list-style-type: none"> <li>- <b>76.7% reduction after 30min</b></li> <li>- <b>89.0% reduction after 3hrs</b></li> <li>- <b>98.7% reduction after 9hrs</b></li> <li>- <b>99.9% reduction after 24hrs</b></li> </ul>
	Staphylococcus aureus ATCC 6538	<ul style="list-style-type: none"> <li>- 3 meters from 405nm light</li> <li>- 30min, 3hrs, 9hrs, 24hrs exposure</li> </ul>	<ul style="list-style-type: none"> <li>- <b>56.4% reduction after 30min</b></li> <li>- <b>67.0% reduction after 3hrs</b></li> <li>- <b>91.7% reduction after 9hrs</b></li> <li>- <b>99.8% reduction after 24hrs</b></li> </ul>
<b>KR Biotech Co Ltd</b> 	Corona virus (SARS-CoV-2)	<ul style="list-style-type: none"> <li>- 50 cm from 405nm light</li> <li>- 60min, 120min exposure</li> </ul>	<ul style="list-style-type: none"> <li>- <b>97.34% reduction after 60min</b></li> <li>- <b>99.16% reduction after 120min</b></li> </ul>
<b>Korea Conformity Laboratories</b> 	Escherichia coli ATCC 25922 Staphylococcus aureus ATCC 6538 Klebsiella pneumoniae ATCC 4352 MRSA	<ul style="list-style-type: none"> <li>- 1 meter from 405nm light</li> <li>- 24hrs exposure</li> </ul>	<ul style="list-style-type: none"> <li>- <b>99.9% reduction for all test organisms</b></li> </ul>
<b>Korea Testing &amp; Research Institute</b> 	Salmonella typhimurium ATCC 13311 Listeria monocytogenes ATCC 19111	<ul style="list-style-type: none"> <li>- 1 meter from 405nm light</li> <li>- 24hrs exposure</li> </ul>	<ul style="list-style-type: none"> <li>- <b>+98% reduction for Salmonella</b></li> <li>- <b>+99% reduction for Listeria</b></li> </ul>

# Real World Testing Clean Edge - Staff Lunch Room

Real-world test was conducted at an installation in a staff/kitchen room at Sydney Duty Free where a swap test via an ATP tester was conducted for 24hrs before and after on high-touch surfaces, within a real life environment e.g. doors being opened, external wind from outside coming in, causing potential germs to repopulate and spread while the light continued to disinfect.

This was another breakthrough result, as it highlighted the ability for the Clean Edge lights to not only reduce but to **MAINTAIN** a low germ environment in real life settings. This is possible because it's a continuous solution, as opposed to manual cleaning which quickly removes germs, however lacks a continuous cleaning solution, where at times hundreds or thousands of people can repopulate germs between cleans.



Light Switch  
Distance – 2.3m  
Before count – 4173  
After count – 426



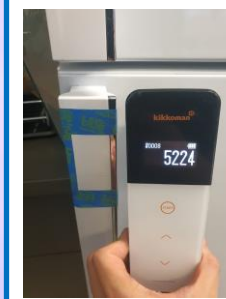
1.  
90%

Table  
Distance – 2.2M  
Before count – 5445  
After count – 444



2.  
92%

Refrigerator Handle  
Distance – 2.6M  
Before count – 5224  
After count – 246



3.  
95%


# Completely safe, as any light in your room


Safety is more important than strength for everyday lighting and the no risk Exemption rating the 405nm achieved was a critical milestone



The International Electrotechnical Commission is the official organization to manage international standards for all electrical goods. The IEC 62471 governs the safety of electrical products on the skin and eyes in 8 different areas. Cleanedge met every standard for continuous safe use and was in the 'no risk' category grade.

- 1 Actinic UV hazard exposure limit for the skin & eye
- 2 Near-UV hazard exposure limit for the eye
- 3 Retinal blue light exposure limit
- 4 Retinal blue light hazard exposure limit-small source
- 5 Retinal thermal hazard exposure limit
- 6 Retinal thermal hazard exposure limit-weak visual stimulus
- 7 Infrared radiation hard exposure limit for the eye
- 8 Thermal hazard exposure limit for the skin

IEC 62471 grade regulation			
Risk Group Exemption 	Risk Group 1	Risk Group 2	Risk Group 3
No Risk	Notice	Caution	Warning

 Page 4 of 19 Report No.: KILT2003-F02334

Test item particulars .....	:	
Tested lamp .....	:	<input checked="" type="checkbox"/> continuous wave lamps <input type="checkbox"/> pulsed lamps
Tested lamp system .....	:	
Lamp classification group .....	:	<input checked="" type="checkbox"/> exempt <input type="checkbox"/> risk 1 <input type="checkbox"/> risk 2 <input type="checkbox"/> risk 3
Lamp cap .....	:	N/A
Bulb .....	:	LED
Rated of the lamp .....	:	200-250 V~, 50/60 Hz, 57 W
Furthermore marking on the lamp .....	:	N/A
Seasoning of lamps according IEC standard .....	:	N/A

# The only 24/7 disinfecting solution with no ongoing labour costs

As 405nm disinfection is a simple light which can be operated by anyone, as it's flicking a switch. Alternatively, can be set up with sensors or timers.

## Temporary manual disinfecting

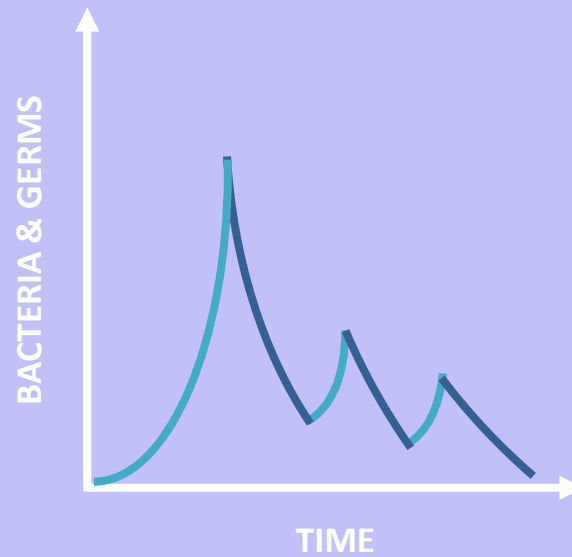
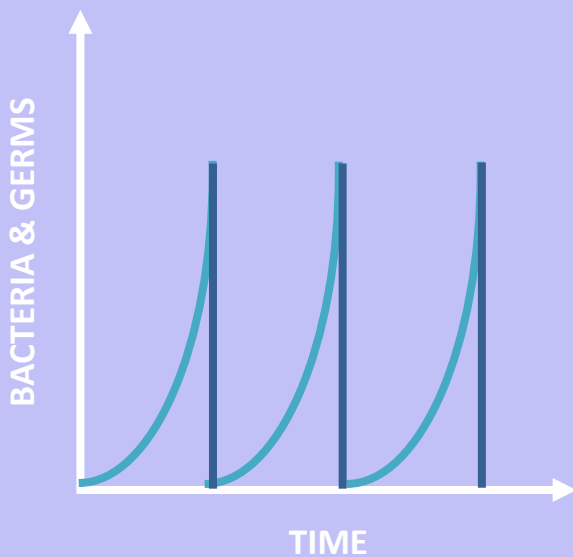
allows germs to grow and build up between cleaning

## Continuous disinfecting

Germ growth is prevented and constantly reduced over time

There are many effective solutions to eliminate germs such as manual wiping, UVC sterilization, ozone, vapor bombing. However, they are all temporary.

Some germs can multiply to reach 1 million in less than 4 hours. 405nm lights are the only continuous solution for germ build up.



# Local customers are loving the new lights!

**Dr Stephen Pak  
Hillcrest Dental**



“I was always thinking of what else we can do to improve level and quality of infection control”

“I couldn't find anything else like it on the market”

“Our staff has very positive feedback, they feel comfortable, more safe”

[PRESS PLAY](#)

# Established manufacturer



## Maltani Co., Ltd. – the manufacturer

Since 1984, Korea's largest lighting company specialized in lighting production with eco friendly tech, design

With world-class pioneering & designing skills, the company was acknowledged in the global market for their consistent effort and results in new product development, R&D and quality control processes for the LED light industry.



Seoul Viosys VIOLEDs, a patented technology also used in NASA's space station for sterilization management

VIOLED technology was co-developed by the Korean company Seoul Viosys, the number 1 market share leader for UV LEDs with over 4000 patents and SETi US based company and globally recognised developer of UV LED products.



# CLEANEDGE

## INSTALLATIONS & RAPID GLOBAL EXPANSION



AIRPORT



TRANSPORT



RELIGIOUS



HOSPITAL



OFFICES



PUBLIC



RETAIL



AUSTRALIA



GERMANY



TURKEY



SINGAPORE



HONG KONG



SOUTH KOREA

Over +2000 private, public institutional installations  
Major Australian retail, hotel, university trials and  
reviews in process

Now tested and ready for wider public usage  
offered to Victoria



# Japanese Hospital Trials & Tokyo Government Subsidy

Clean Edge/Linear installations at Private Medical Hospital in Japan

Department of Microbiology at Nara Medical University validated SARS-CoV-2 reduced by 99.89%

Tokyo government is subsidising SMEs for infection/disease control measures

The article says it is possible to get Tokyo government funding, which they're either basing on a successful example or highlighting possibility.



**PRTIMES** プレスリリース・ニュースリリース配信サービスのPRTIMES  
Top | テクノロジー | モバイル | アプリ | エンタメ | ビューティー | ファッション | ライフスタイル | ビジネス | グルメ |

医療施設(コロナ病棟・発熱外来) 官公庁施設に続々導入! 日本初の可視光線405nm LED照明「クリーンリニア」  
日本初のクリーンリニアでコロナ対策! 東京都の感染症対策サポート助成事業3月31日まで!

G-SmattJapan株式会社 ♡ 21 🐦 📘 🌱 📄 🔗  
🕒 2022年1月20日 15時30分

G-Smatt Japan株式会社(本社:東京都渋谷区・代表取締役:柳景仁)は、可視光線405nmの波長をもつLED照明「クリーンリニア」を医療関係では初めて、医療法人社団仁心会 越谷ハートフルクリニック(院長 佐藤陽二氏/埼玉県越谷市)に導入しました。

# HUG – Project milestones

- Supply contracts secured, October 2020
- International testing validation & Local Australian testing and guideline completion, May 2021
- Go to market soft launch June 2021, social media, private installations
- Reviews (majors in discussion): 1 grocery retailer, 2 hotel chains, 1 university, NSW gov't venue
- PR launch planning for March 2022

**HUG & Lifetime Lights are keen to partner with VIC Health in particular for the Hospital, Aged Care sectors.**



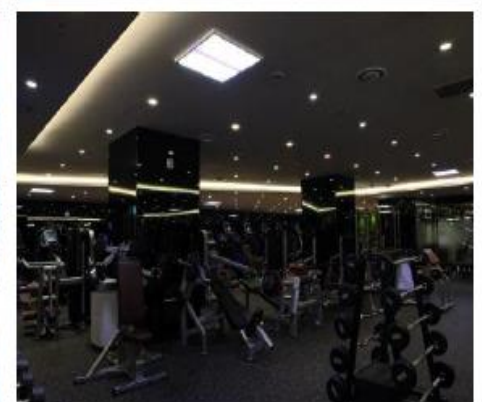
# Thank You



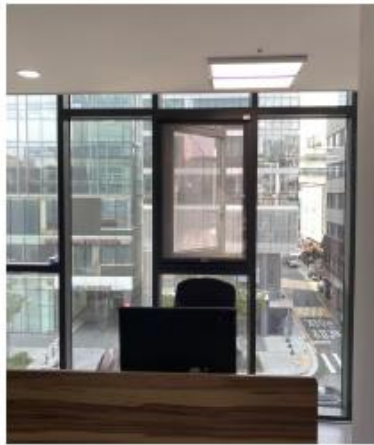
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# HOSPITAL, HEALTH & ACCOMODATION



# OFFICE & WORKPLACES



# SCHOOLS & CHILDCARE



# RESTAURANTS & FOOD BUSINESSES

