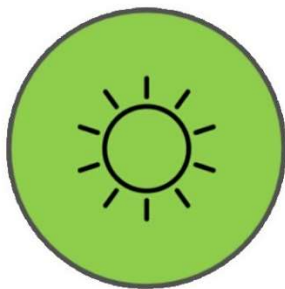


# Sunlight Disinfection™

## T8 LED



## Bringing Innovation to Light, Bringing Health to You

To Fight the growing epidemic of Hospital Acquired Infections (HAIs), hospitals have turned to expensive sterilize cleaning systems utilizing Ultraviolet (UVC) disinfection lights. UVC is limited as they can only be used when patients and staff are not in the room. This is because UV wavelengths are a known to be harmful to human eyes and skin and causes cancer.

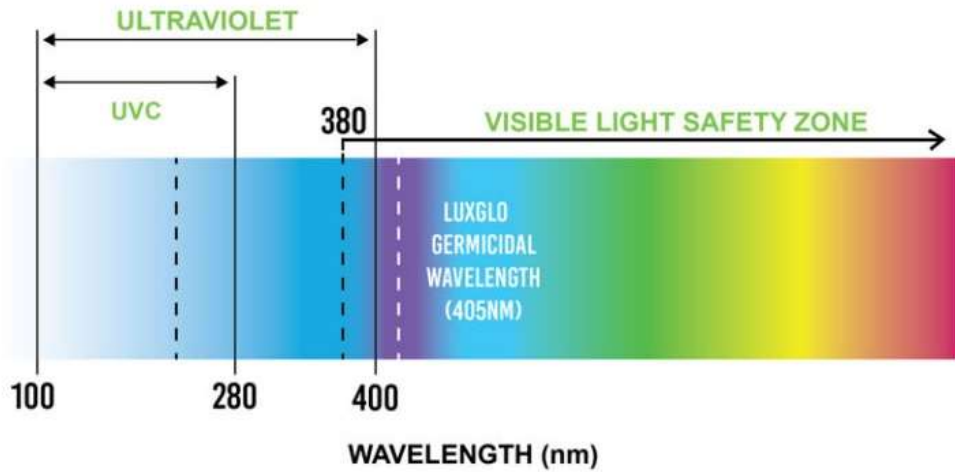
Luxglo's Sunlight™ 405-nm LED light, inactivate infectious pathogens include such as Escherichia, Salmonella, Listeria, Shigella, and the highly deadly methicillin-resistant Staphylococcus aureus (MRSA) without harming human eyes and skin. The results also showed the inactivation of the highly lethal methicillin-resistant Staphylococcus aureus (MRSA), demonstrate that our patented Sunlight™ narrow-spectrum 405-nm LED demonstrate is an effective method for disinfection with a wide range of potential applications.

## What's Sunlight Disinfection™ Technology?

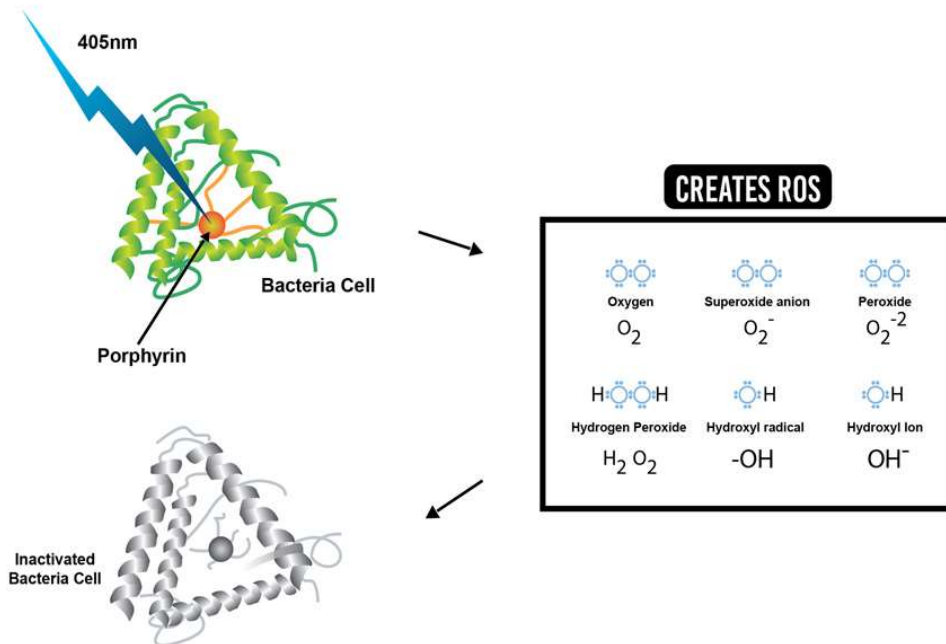
To fight the growing epidemic of Hospital Acquired Infections (HAIs), hospitals have turned to expensive sterilize cleaning systems utilizing Ultraviolet (UVC) disinfection lights. UVC is limited as they can only be used when patients and staff are not in the room. This is because UV wavelengths are known to be harmful to human eyes and skin and cause cancer.

Luxglo's Sunlight™ 405-nm LED light is the technology that continuously disinfection by inactivating infectious pathogens include such as Escherichia, Salmonella, Listeria, Shigella, and the highly deadly methicillin-resistant Staphylococcus aureus (MRSA) without harming human eyes and skin. The results also showed the inactivation of the highly lethal methicillin-resistant Staphylococcus aureus (MRSA), demonstrate that our patented Sunlight™ narrow-spectrum 405-nm LED demonstrate is an effective method for disinfection with a wide range of potential applications.

# What is Luxglo's 405nm Sunlight Disinfection™?



**405 NANOMETERS: PEAK GERMICIDAL ACTIVITY VIA PHOTOEXCITATION OF PORPHYRIN MOLECULES**

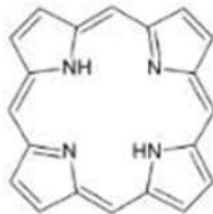
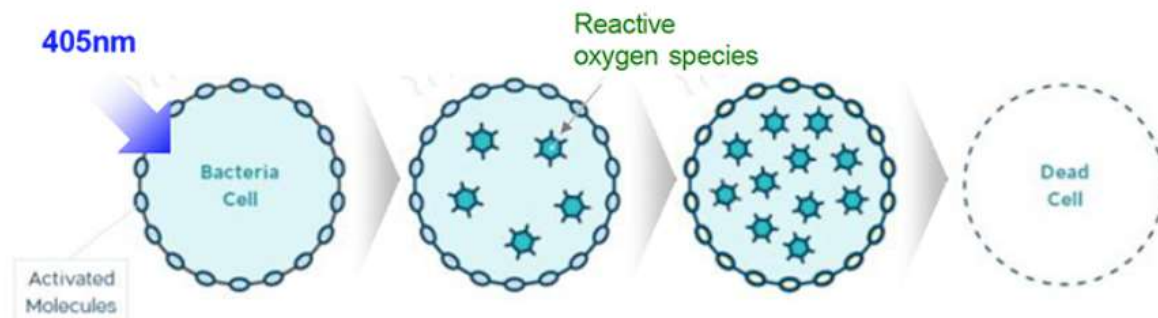


# 405nm Disinfection Concept

## ☐ Sterilization Type

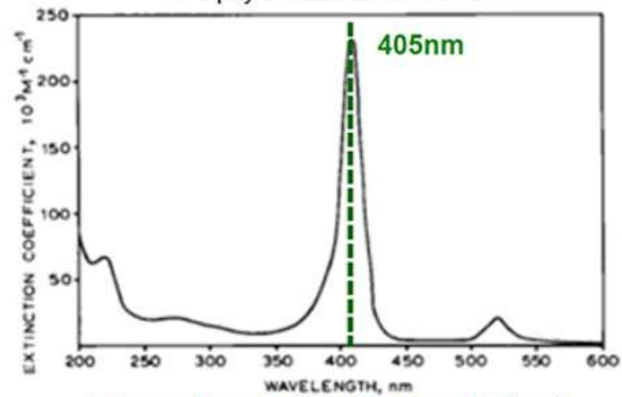
### • Porphyrin excitation (405nm)

- ROS(Reactive oxygen species) created from reaction of 405nm light & porphyrin destroy cell inside of bacteria

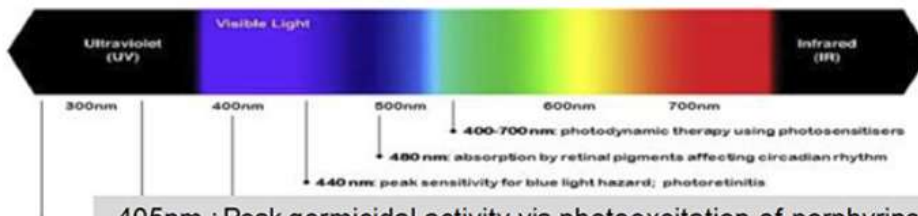


※Porphyrin : substance inside of bacteria that react with 405nm light

< Porphyrin Absorbance Curve >



※Source : A journal published by Johnson Matthey Plc.



※Source : Report of Seoul University

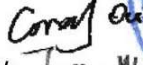
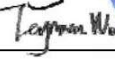
405nm : Peak germicidal activity via photoexcitation of porphyrins; oxidative damage

# 405nm Photobiological Test Result

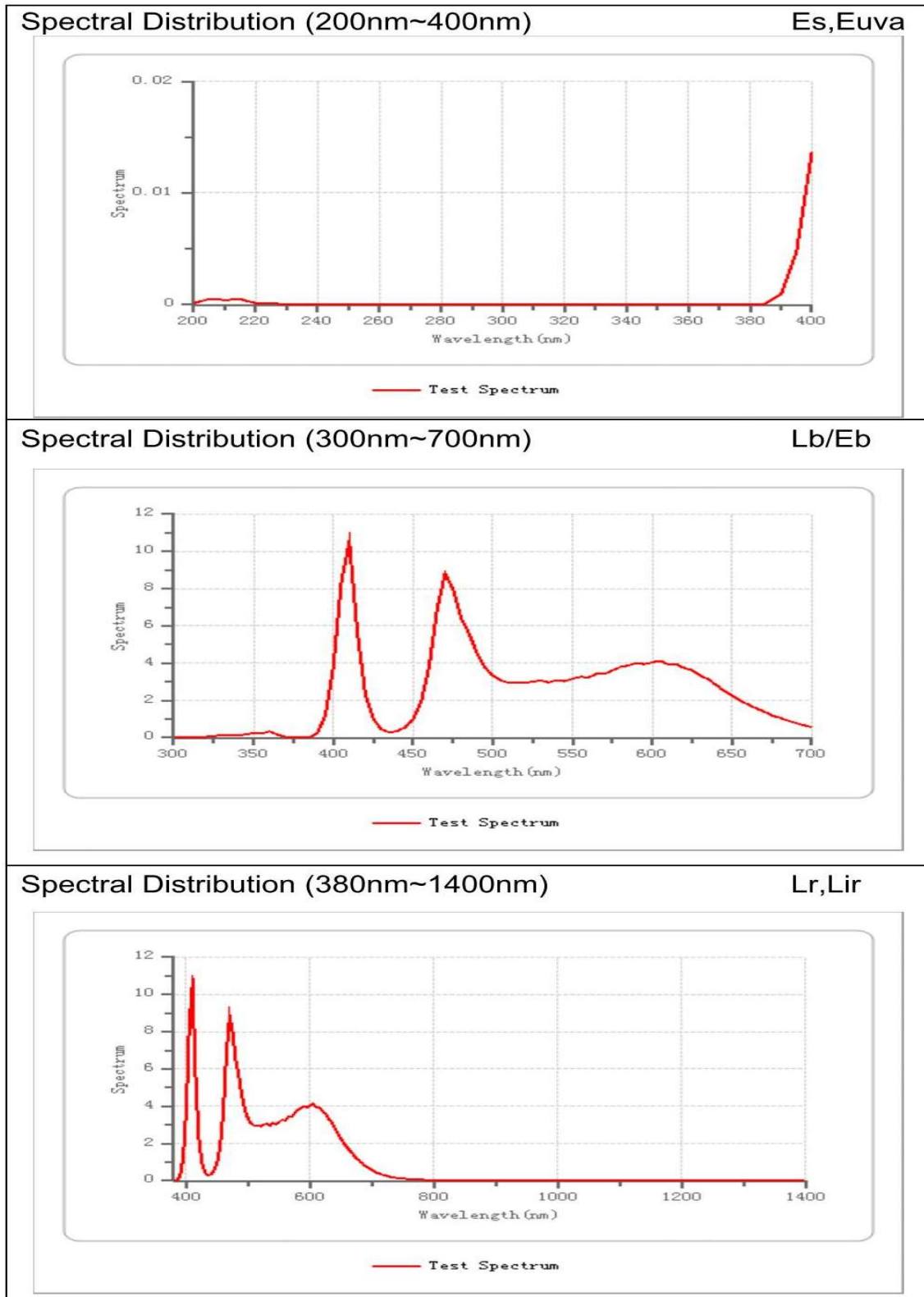
## <Continuous Mode>

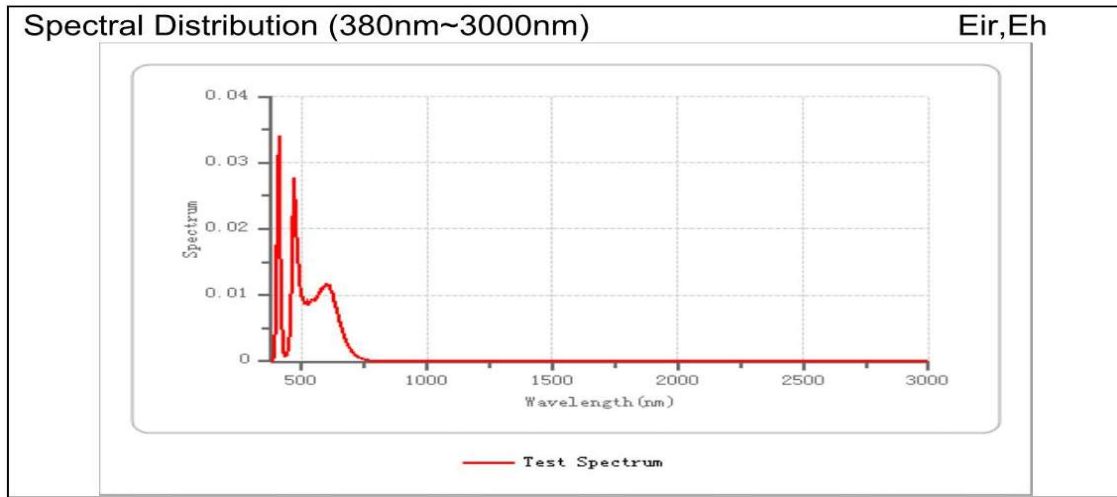
- Photobiological Stability Test: Testing Harmfulness Lighting Device (Human body and eyes)
- Exempt / Low Risk / Mod Risk : 3 Step
- [IEC62471 Test Result: Exempt Grade](#)
- ✓ Got 'Exempt' Grade from Actinic UV/Near UV Emission Measurement

Test Results							
Emission Limits for Risk Group of Continuous Wave Lamps							
Risk	Units	Exempt		Low Risk		Mod Risk	
		Limit	Result	Limit	Result	Limit	Result
Actinic UV, Es	W·m-2	0.001	3.210E-04	0.003	3.210E-04	0.03	3.210E-04
Near UV, Euva	W·m-2	0.33	1.954E-02	33	1.954E-02	100	1.954E-02
Blue light, Lb	W·m-2·sr-1	100	4.874E+01	10000	7.604E+02	4000000	1.214E+03
Blue light, small source, Eb	W·m-2	-	-	-	-	-	-
Retinal thermal, Lr	W·m-2·sr-1	5.108E+05	9.389E+03	5.108E+05	9.389E+03	1.295E+06	1.499E+04
Retinal thermal, weak visual stimulus, Lir	W·m-2·sr-1	1.095E+05	2.917E+00	1.095E+05	2.917E+00	1.095E+05	2.917E+00
IR radiation, eye, Eir	W·m-2	100	7.168E-04	570	7.168E-04	3200	7.168E-04
IR radiation, skin, Eh	W·m-2	3556.56	6.036E-01	NA	NA	NA	NA
Angular subtense of apparent source				α =54.82mrad			
Averaged Luminance Test Results							
Symbol	FOV(mrad)	Units	Results				
L1	1.7	cd·m-2	1.399E+06				
L2	11	cd·m-2	8.759E+05				
L3	100	cd·m-2	5.615E+04				
Over view of Classification							
Hazard				Risk Group			
Actinic UV				Exempt Group			
Near UV				Exempt Group			
Blue light				Exempt Group			
Retinal thermal				Exempt Group			
Retinal thermal, weak visual stimulus				Exempt Group			
IR radiation, eye				Exempt Group			
Classification group				Exempt Group			

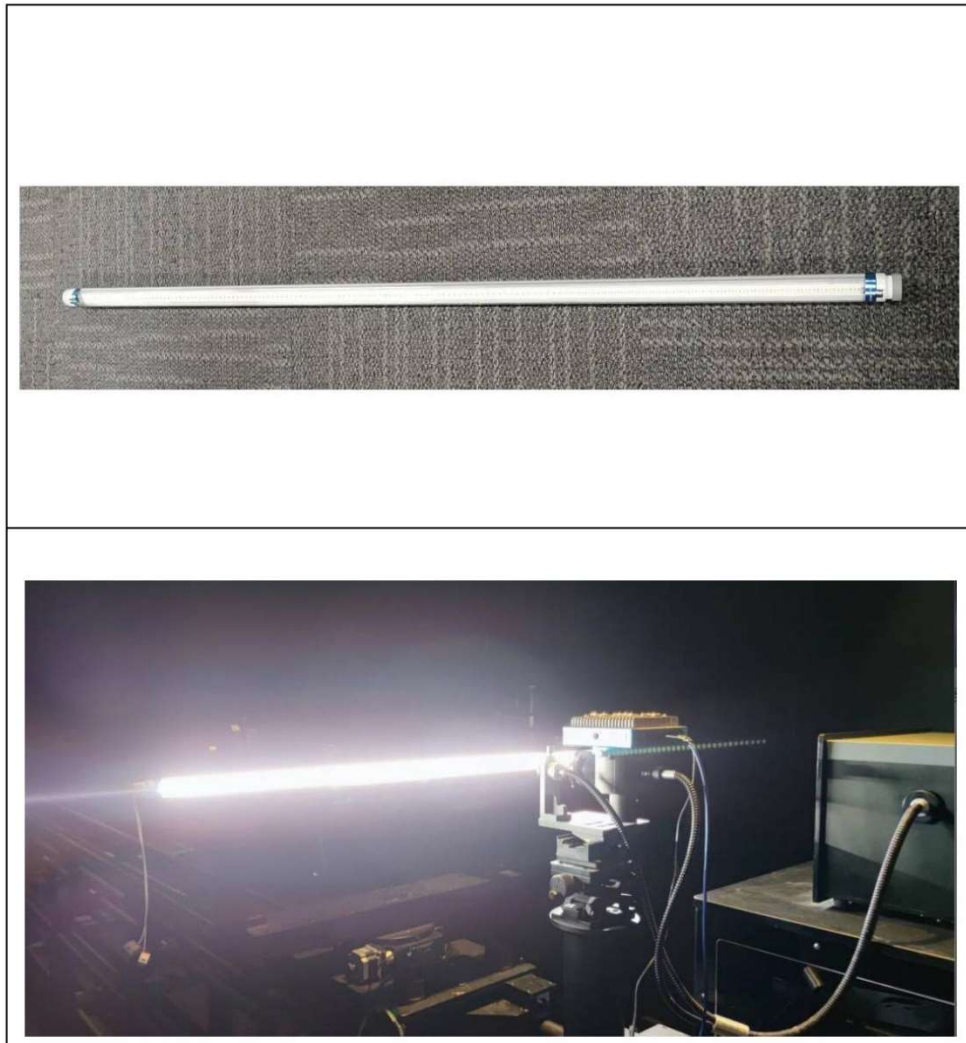
<b>Test Report</b> <b>IEC 62471:2008</b> <b>Photobiological safety of lamps and lamp systems</b>	
<b>Test Report No.</b> .....:	JBS200807-H
Date of Issue.....:	2020/8/13
Total number of pages.....:	5
<b>Testing Laboratory</b> .....:	Standard-Tech Co., Ltd.
Address.....:	Standard-Tech Building, No. 6 Guanghong Road, Guangzhou Science City, Guangzhou 510663, CHINA
Tested by(+ signature).....:	Corey Ou 
Reviewed by(+ signature).....:	Feynman.Wu 
<b>Applicant's name</b> .....:	LUXGLO
Address.....:	1241 Quarry Lane #140 Pleasanton, CA 94566
<b>Test Specification</b>	
Standard.....:	IEC 62471:2008
<b>Test Item Description</b>	
Model/Type:.....:	T8-D-3-420-BDAB
Manufacturer.....:	LUXGLO
Test Model:.....:	T8-D-3-420-BDAB
<b>Test item particulars</b>	
Test lamp or lamp system.....:	Continuous wave lamps
Lamp classification group.....:	Exempt Group
Lamp cap.....:	N/A
Bulb.....:	N/A
Rated of the lamp.....:	100-277V~, 50/60Hz, 0.27A, 20W
Trade Mark.....:	LUXGLO
Lamp Bead Manufacturer.....:	LUXGLO
Lamp bead model.....:	INFE-2835-DF-S-CT-R
Seasoning of the lamp according IEC standard.....:	N/A
Measurement condition.....:	25.4 °C
Measurement distance.....:	0.2m
<b>Testing:</b>	
Date of Receipt Test Item.....:	2020/8/13
Date of Performance of Test.....:	2020/8/13

## IEC62471 Test Date Chart





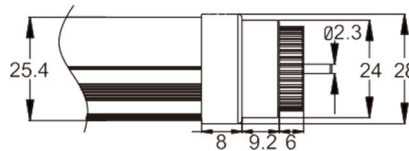
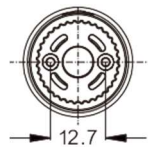
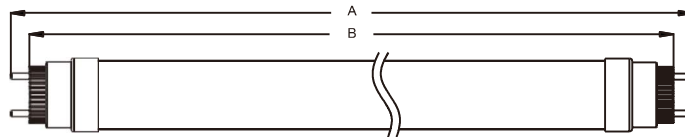
## IEC62471 Test Lab Photo





# Sunlight™ Disinfection T8 LED

PRODUCT SPECIFICATION	
Length	2ft / 4ft ANSI Standard
Housing	Aluminum & Polycarbonate
Optics	Clear PC, 120°
Endcap	G13, Rotatable, Single Ended
Input	100-270VAC, 50/60 Hz
Driver	Internal constant current, Type A+B
Power Factor	>0.90
Wavelength	UVA 405nm +/- 5
CRI	>80
Beam Angle	120°
Luminance Efficacy	80LM/W
Power Consumption	9W / 20W
LUMEN	760lm / 1600lm
Color Temperature	4000K
Certification	*ETL Type A+B and UL Type B



Intertek

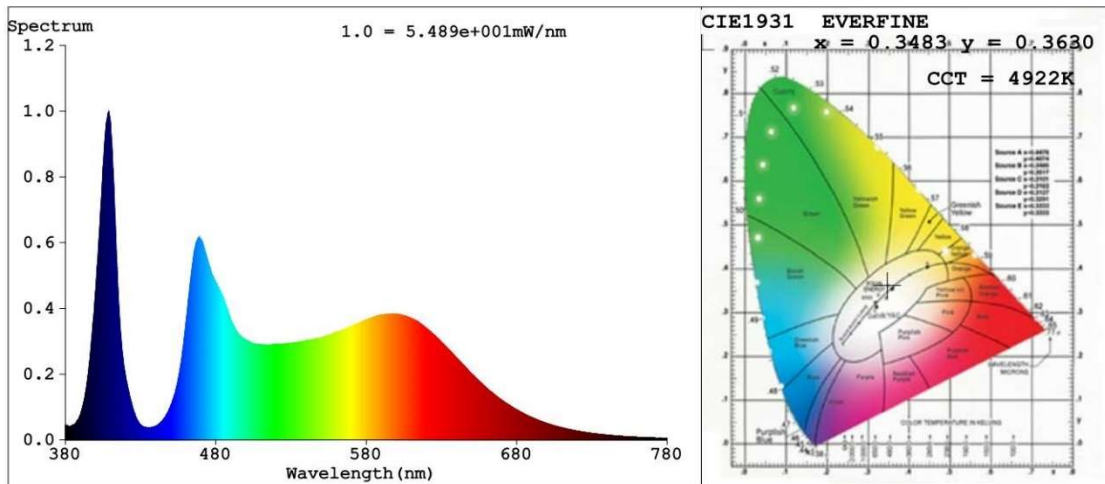


	2feet	4feet
A	602mm	1212mm
B	588mm	1198mm

# Laboratory Certification



## Spectrum Test Report



### Colorimetric Parameters

Chromaticity Coordinate:  $x=0.3483$   $y=0.3630$   $u'=0.2092$   $v'=0.4906$

CCT=4922K (Duv=0.0044) Dominant WL:Ld =570.1nm Purity=13.5%

Peak WL:Lp=408.9nm FWHM=13.9nm

Render Index: Ra=84.2

R1 =94	R2 =93	R3 =81	R4 =76	R5 =91	R6 =89	R7 =78	
R8 =70	R9 =42	R10=86	R11=78	R12=83	R13=98	R14=90	R15=86

### Photometric & Radiometric Parameters

Flux=1604 lm Eff.:81.32 lm/W Fe=6.241 W

### Electrical parameters

V=120.0 V I=0.1698 A P=19.73 W PF=0.9689 F=59.98 Hz

Status: Integral T = 52 ms Ip = 49194 (75%)

Test Mode: Fast Test; Sensitivity = High; Tcool: ON

Model:T8-D-3-418-BDAB  
 Test By:Wayne Chu  
 Temperature:25Deg  
 Manufacturer:Luxglo

Number:S01  
 Date:2020-07-21 16:09:04  
 Humidity:42%  
 Remarks:T2007073

## Continuously Disinfect Environments



## Experimental about using 405nm for Disinfection

<https://pubmed.ncbi.nlm.nih.gov/25066049/>

[https://stacks.cdc.gov/view/cdc/80239/cdc\\_80239\\_DS1.pdf](https://stacks.cdc.gov/view/cdc/80239/cdc_80239_DS1.pdf)

[https://www.ajicjournal.org/article/S0196-6553\(19\)30746-1/pdf](https://www.ajicjournal.org/article/S0196-6553(19)30746-1/pdf)