

HOW CAN LIGHT INCREASE PRODUCTIVITY & WELLNESS

What you can't see can hurt you



The human eye can detect visible flicker below 90Hz. Flicker above our visual threshold may not be able to be seen by the human eye but this flicker is registered by our nervous system.

Whilst you may not be able to see the light flicker, your brain can still perceive it and it can cause multiple neurological problems depending on a person's sensitivity. Some of the side effects are migraines, eye strain, decrease in productivity and an increase in behavioral issues.¹

Flicker impacts workplace safety as well as productivity. It can affect the comfort of work spaces and our overall health and emotional wellbeing.

Common neurological impairments from light flicker

MIGRAINES



25-50% of migraine sufferers identified flicker as a trigger.^{*2}

DECREASE IN PRODUCTIVITY



Prolonged exposure to flickering light can contribute to a decrease in concentration and a lack of productivity and fatigue.^{*3}

INCREASE IN BEHAVIOURAL ISSUES



People suffering from Autism Spectrum Disorder (ASD) can have increased behavioral issues due to flicker.

EPILEPTIC SEIZURES



A visible flicking light can cause epileptic seizures in susceptible people.

^{*1} IEEE. "IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers".

^{*2} L. Debney, "Visual stimuli as migraine trigger factors," Progress in Migraine Research, pp. 30-54, 1984.

^{*3} Veitch, J. A., & Newsham, G. R. "Lighting quality and energy-efficiency effects on task performance, mood, health, satisfaction and comfort." Journal of the Illuminating Engineering Society, 27(1), 107-129.

OPTICAL FLICKER IN LIGHTING

What you can't see can hurt you

The most common cause of flicker is the fluctuation in the power supply. The grid supplies AC power to offices and other buildings whilst the electrical device plugged in converts the AC to DC power.

Optical flicker is caused by the AC power changing direction, this results in the voltage changing direction with the current and the light then fluctuates or visually turning on and off.

Temporal light artefacts are the visual effects that change the way that we see our surroundings, triggered by a light source. Temporal light artefacts are divided into three different categories: flicker, stroboscopic effect and phantom array.

Not all LED panels are created equal... The drivers that assist with the AC current conversion to DC, sometimes may cause a ripple effect on the DC power supply which can result in flicker. How much flicker is influenced almost entirely on the driver design.

Driver design reduces harmful effects from flicker

enLighten's Skyline panel is low glare and flicker free. The high-quality driver delivers a flicker free, isolated and constant current power supply and this helps to reduce light flicker.

WHERE COULD YOU BE AFFECTED?



Offices

Poor lighting and lighting flicker can contribute to the 3pm slump. Sitting under flickering light can cause headaches, eye strain and loss of productivity.



Classrooms

The effects from flicker in a classroom can contribute to a student and/or teacher's inability to concentrate and it also affects productivity. Flicker can cause headaches and eye strain. For those who suffer from Autism Spectrum Disorder, flicker can lead to an increase in behavioral issues.



Fast-moving machinery

Stroboscopic effect can be caused from flicker, this changes the way we see moving parts, they appear to move slower than they actually are. This could be dangerous when working with heavy machinery.

DESIGNED TO PERFECTION

SKYLINE OUTPERFORMS THE REST

TIPS FOR CHOOSING THE RIGHT PANEL



Choose a flicker free, isolated and constant current driver and stop any neurological impairments from flickering panels.



Ensure the Light Guiding Plate (LGP) is made from PMMA (polymethyl methacrylate). This will prevent the yellowing of the light. Inferior materials like PS (polystyrene) will turn yellow within 1 to 2 years due to UV aging.



Don't let your lights fall out of the ceiling, choose a product with a reinforced back plate. Ensure your back plate is BUILT TO LAST.



Check the structure of the light and ensure the LGP has a buffer between it and the LEDs, without an air gap the LEDs may get damaged and a shift in colour can occur. Who wants ceiling lights that look like a patchwork quilt?



Choose a low glare panel with even light and heat distribution.



SKYLINE



ULTRA LONG LIFE SPAN >120,000 HOURS

UP TO 70%
**ENERGY
SAVINGS**

BUILT TO
LAST

>90%
**LIGHT
UNIFORMITY**

DOUBLE
**EDGE LIT
PANEL**



FLICKER FREE



LOW GLARE UGR<19



DON'T GET CAUGHT OUT

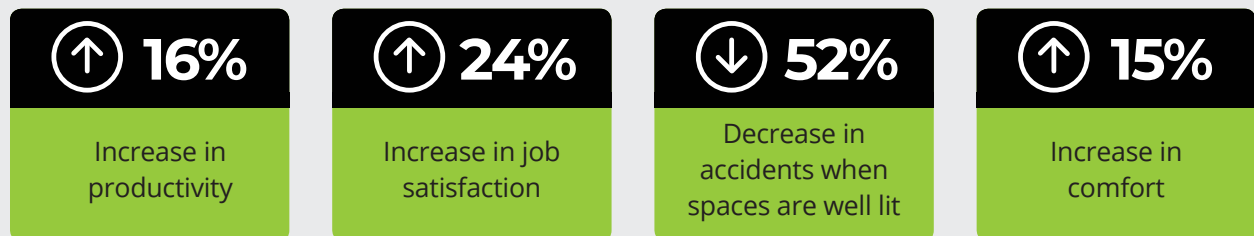
"It would be easy to select cheap inferior panels to sell... but there is little point in replacing all your lights to do it all again in 1-2 years time and this time at your cost. Choosing the right product first time has never been so important, there are a lot of cheap inferior products on the market at the moment. Don't get caught out."

Steve Cahill, CEO enLighten

INVESTING IN PEOPLE MEANS INVESTING IN GOOD OFFICE LIGHTING

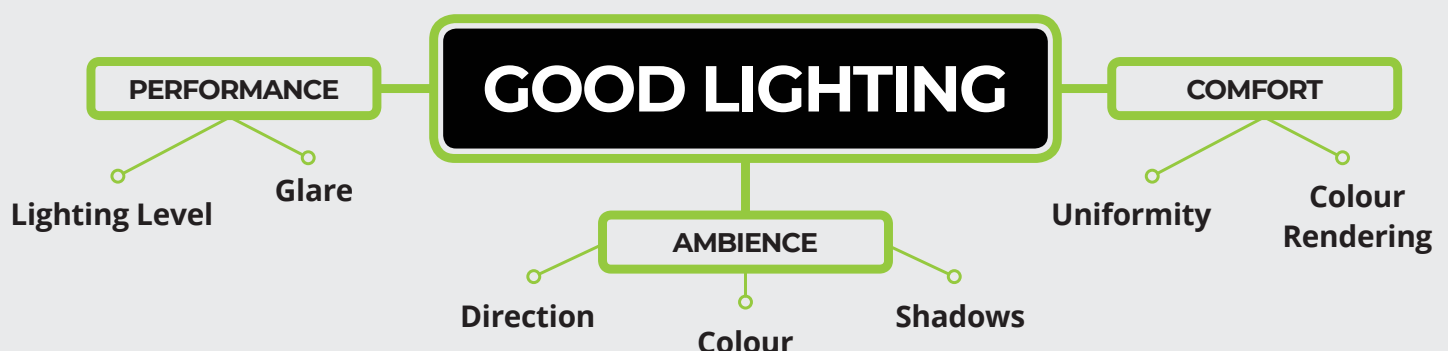
In a commercial office building, it's important to get the lighting right to create a comfortable and safe working environment. It is essential to use the right lux levels for the task at hand and to consider glare index.

Best practice office and lighting design can



Impact of Design Series, Vol.1 American Society of Interior Designers

UNDERSTANDING HOW IT WORKS: IMPROVE PRODUCTIVITY, EMPLOYEE MOODS AND VISUAL ACCURACY.



OFFICE , EDUCATION FACILITIES, WORKSHOPS AND LIBRARIES

Recommendations as per AS 1680

Entrances	LUX	MAX UGR
Entrance halls, lobbies, foyers	160	-
Waiting rooms	160	19
Enquiry desks	320	19

Circulation areas	LUX	MAX UGR
Corridors, passageways, ramps	40	-
Stairs	80	-

Staff canteens, cafeteria, dining room	LUX	MAX UGR
General	160	-
Counters	240	-

Staff rooms	LUX	MAX UGR
Changing rooms, locker rooms	80	-
Cloakrooms	80	-

First Aid Centres	LUX	MAX UGR
Treatment rooms	320	19

Toilets	80	-
---------	----	---

Control and monitoring rooms	LUX	MAX UGR
- Intermittently monitored	240	-
- Continuously monitored	320	19

General tasks involving typing, reading and writing	LUX	MAX UGR
Task	320	19
Background/environment	160	19

Screen based tasks	LUX	MAX UGR
Keyboards	160	19
Reference material - Good, simple	240	19
- Average detail	320	19
- Poor, fine detail	600	19
Background environment	160	19

Drafting offices	LUX	MAX UGR
Drawing board	600	19
Reference material - Good, simple	320	19
- Poor, fine detail	600	19
Background environment	240	19

*Higher lux levels (>400 lux) may require localised task lighting in addition to general lighting



OFFICES, EDUCATION FACILITIES, WORKSHOPS AND LIBRARIES

Recommendations as per AS 1680

Meeting rooms	LUX	MAX UGR
Meeting rooms	320	19
Training rooms, seminar rooms	240	19
Conferring rooms, boardrooms	240	19

Photocopying and printing rooms	LUX	MAX UGR
Intermittent	160	25
Sustained, collating, colour copying	240	19

Filing areas	LUX	MAX UGR
Sorting – Simple, clear detail	240	19
– Difficult, fine detail	320	19

Auditoriums	LUX	MAX UGR
Assembly halls – general use	160	19
Social activity	80	19
Examinations	240	19

Conference rooms	LUX	MAX UGR
Video conferencing – Conference table	600	-
– Rear Wall	160	-

Classrooms	LUX	MAX UGR
General use	240	19
Laboratories	320	19
Lecture rooms	240	19
Music rooms	320	19
Reading rooms	320	19
Sewing rooms – General	320	19

Libraries	LUX	MAX UGR
Audio listening areas	160	19
Audiovisual areas	240	19
Book stacks	240	19
Individual study areas	320	-
Circulation desk	320	19

*Higher lux levels (>400 lux) may require localised task lighting in addition to general lighting

SKYLINE

ULTRA LONG LIFE SPAN >120,000 HOURS

UP TO 70%
**ENERGY
SAVINGS**

**FLICKER
FREE**

>90%
**LIGHT
UNIFORMITY**

**LOW
GLARE**
UGR<19

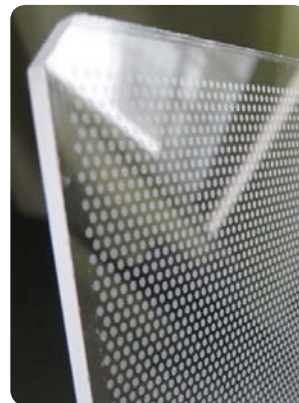
**LED PANEL
LIGHTING FOR
OFFICES &
SCHOOLS**



LOW GLARE
UGR <19

FLICKER & GLARE FREE

The Skyline panel is engineered to give you a uniform, low glare and flicker free light to ensure the highest level of lighting comfort.



SUPERIOR OPTICAL DESIGN

>90% LIGHT UNIFORMITY

Achieves up to 92% light transmission through a high quality internal PMMA light guiding plate.

There is no yellowing of panels over time, so your fitting will remain attractive for years to come.



BUILT TO LAST

Superior design with an edge-folded backplate & welded frame for strength and durability.

Skyline is a slim lined LED panel designed to achieve the Australian Standard lux levels (AS 1680) for the office and school environment.



5 YEAR
WARRANTY

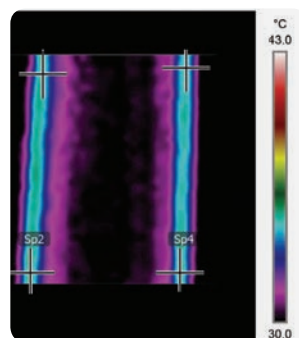
QUICK & EASY RETROFIT

Quick and easy to install the Skyline panel has flexible mounting options such as surface, recessed and suspended mounting options.



AIR GAP PROTECTED LEDs

Designed to perfection the double interior frame uses two spacers, one offering protection against LED crushing and the second for expansion of the Light Guide Plate under heat.



DOUBLE EDGE LIT PANEL

Cooler temperatures are achieved using LEDs on both sides, this ensures a longer lifetime for the panel.

Skyline has been designed to last.



enLighten

Innovation in Lighting Solutions

8/78 Reserve Road, Artarmon, NSW 2064 Australia

Call us on 1800 365 444 | enlighten.com.au
sales@enlighten.com.au



enLighten

Innovation in Lighting Solutions

**5 YEAR
WARRANTY**

SKYLINE

DOUBLE EDGE LIT LED PANEL



Outperform. Outlast.

Call us on 1800 365 444

| enlighten.com.au