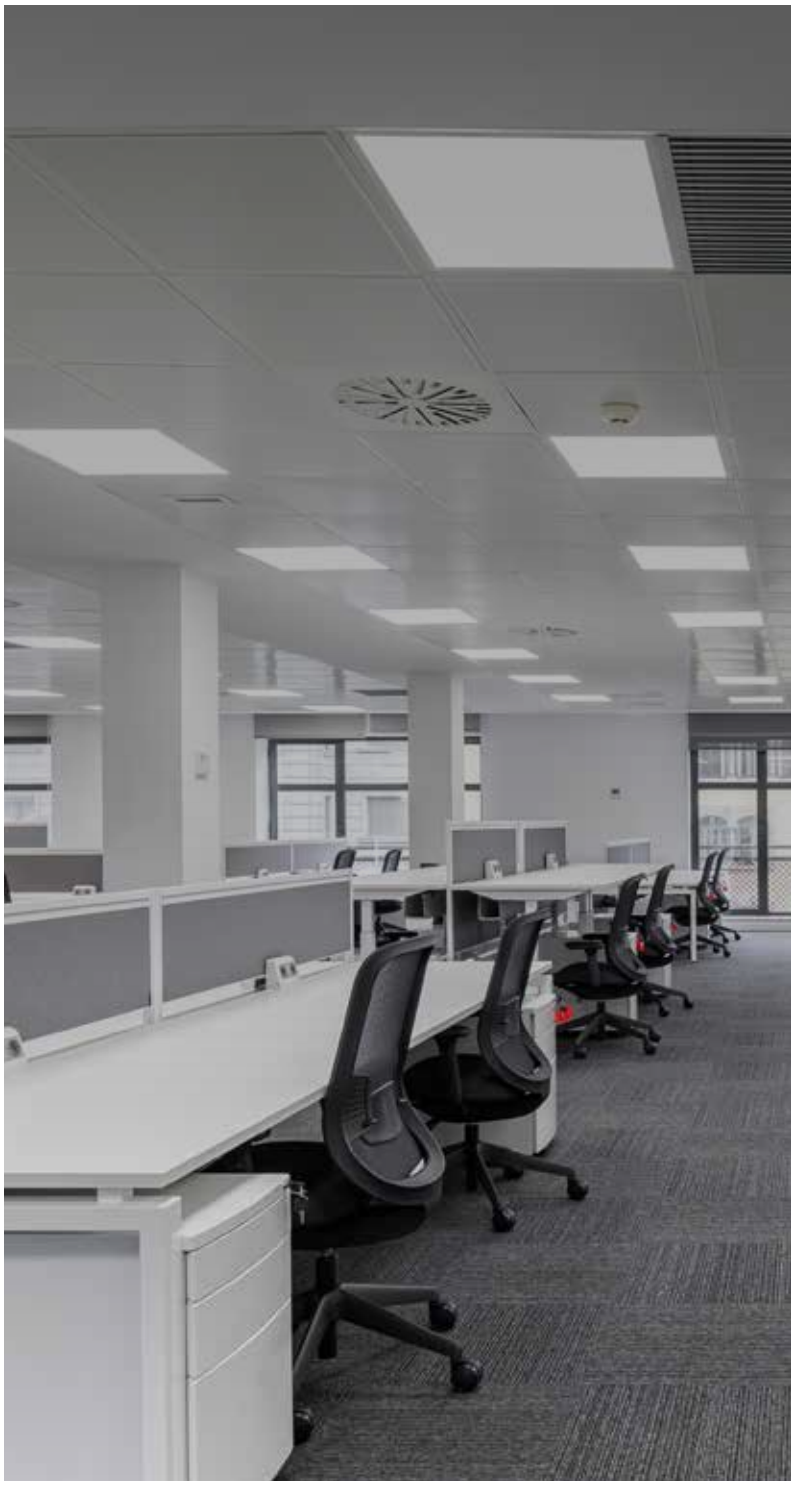
Lumen Depreciation

Risk and Remedy



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Unlike traditional lighting options (incandescent, Fluorescent, halogen etc..) where illumination failure was easy to recognize , whether that was due to not illuminating at all, blackening, flashing or just being recognizably dull, you always had an idea that they required changing. LED doesn't offer any immediate indication of decreased output, as Lumen Depreciation is a gradual process one that is very rarely noticed.

In reality this is happening now under the radar. In many occasions there is light but it isn't right, which effects the overall lighting levels of an area creating unpleasant working conditions as well as a greater health and safety risk.

What is lumen depreciation?

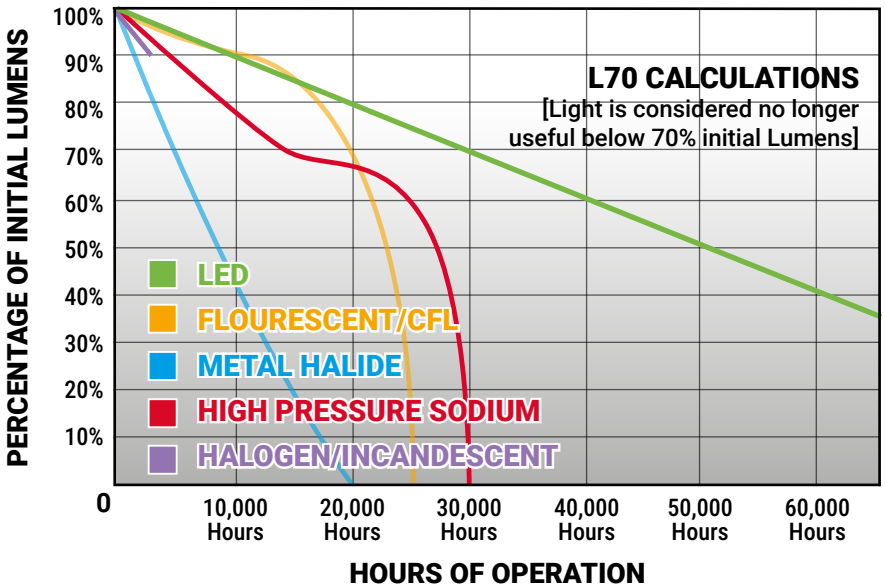
Lumen depreciation is simply stated as the loss of lumen output over a period of time in any given light source.

Lumen depreciation is when lumens are lost gradually over time due to repeated use.
For instance, if a light source produces 900 lumens when brand new and in five years only produces 700 lumens, that is a depreciation of 200 lumens.

Are certain light sources better than others in this aspect?

Whilst LED light sources have a less aggressive Lumen depreciation cycle than older technologies, they are not infallible and still require monitoring and ultimately replacing.

LUMEN MAINTENANCE CURVES
LED v Traditional Light Sources



What is Lumen maintenance?

L70 lumen maintenance refers to the point in an LED's lifespan when its light output has decreased to 70% of its initial brightness. It's a way to measure how long an LED light source will maintain a usable level of light output before it needs to be replaced. In essence, an L70 rating of 30,000 hours means that after 30,000 hours of use, the LED is expected to produce at least 70% of its original light output.

Why does it matter?

The reason lumen depreciation is important is because most spaces require a specific LUX level to ensure appropriate illumination (CIBSE LUX Level Guide). If the LED light source loses these lumens over time this will impact the LUX levels within the area making the area appear dimmer.

Lumens = Amount of light emitted by a light source
Lux = A unit for measuring the direct illumination on a surface

The below table shows the required total illuminance (Lux) levels for some common areas:

Area	Maintained Illuminance (Lux)
Entrance Lobby	200
Reception Area	300
Corridor/Stairs	100
General Office	350-500
Conference Room	300-350
School Assembly Hall	300
Sports Hall (Class III)	300
Village Hall	300
Warehouse	150-200
Workshop	300-500

Effects of poor lighting

Wellbeing: Poor lighting in a workspace can to make employees feel sluggish, depressed, and stressed, which could result in reduced concentration.
Safety: Reduced visibility which could result in accidents.
Comfort: Inadequate or improper lighting can strain the eyes and cause discomfort, leading to visual fatigue, headaches, and eye-strain.
Productivity: Poor Lighting could increase the risk of errors and the ability to perform tasks accurately.
Absence: All of the above could have a cumulative impact increasing employee absence.

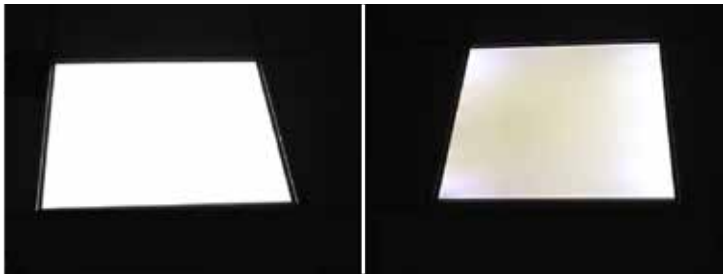
What to look out for?

There are a few tell-tale signs where light sources may be subject to Lumen depreciation which are easily identifiable.

Noticeable difference in brightness from one light source to another.

Discolouring of the light source.

Dark patches / Inconsistent shadowing.



Testing Light Levels

The simplest way to measure light is to use a Light Meter/ Lux Meter, the two phrases are often interchangeable. Light meters contain a sensor that converts the light energy into an electrical charge that can give the user a reading. They are typically small enough to be hand-held and portable.

ETHOS-4430

Using a Light Meter / Lux Meter

Using the Light Meter / Lux Meter is simple. After taking the cap off the sensor, simply place it on a surface where a task is carried out such as the centre of a desk. It is important the sensor is placed on the surface as this is where the light is reflected into the user's eye and represents the true level of light they receive. Holding the light meter above the surface would produce potentially inaccurate readings. The Lux reading should then be displayed on the display.

Compare this to the Illuminance Levels (Lux Levels) set out in the CIBSE Guidelines.

Conclusion

Should you feel that lumen depreciation is a factor within your property, please feel free to reach out to the Fusion Luminaries team to offer further guidance, site visits and lighting designs.

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Glossary Of Terms

Light Source	Device whose primary function is to produce visible or near-visible radiant energy for general illumination, Lamp or Fixture
LED	Light Emitting Diode used to produce light
Lumen	Amount of light emitted by a light source
Lux	A unit for measuring the direct illumination on a surface
CIBSE	Chartered Institution of Building Service Engineers produces internationally recognised Guidance and Codes

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