

Glossary

Accent Lighting - controlled directional light to emphasise or highlight a particular subject or object.

Ambient Lighting - the general lighting present in an area excluding task lighting and accent lighting but including general lighting and daylight.

Analogue Dimming - a dimming system employing analogue input signals. A DC voltage is sent to the control gear which dims the lamp in response to the voltage. Typical protocols include 1-10V, 0-10V, and trailing edge dimming (triac dimming). Such systems benefit from simplicity but lack the flexibility of customisation.

Beam angle - the angle between the two planes or points of light emitted from a light source where the intensity is 50% of the maximum intensity (usually at the centre) of the beam.

Binning - the process LED diodes go through where they are tested and allocated to a 'bin' which is labelled in accordance with the Macadam Ellipse Steps (see below). A one or single bin led would contain diodes only from one particular bin eg 2-step MacAdam ellipse.

Correlated Colour Temperature (CCT) - a term used to describe the colour appearance of a white light source, measured in degrees Kelvin (K). The higher the colour temperature the whiter, or bluer, the light will be. Warm light sources are around 2000-3000K and Cool light sources over 4500K. Daylight has CCT of 6500K

Colour Rendering Index (CRI) - a quantitative measurement of how accurately a light source renders an objects' true colour. The CRI scale is 1-100, with 100 being daylight at noon on a clear day. The lesser the number, the harder it becomes to distinguish between colours, particularly ones such as navy, blue and black.

CRI in the 60's is satisfactory for basic cool white light in areas such as industrial storage.
CRI in the 70's is satisfactory for general lighting in non critical areas but not considered suitable for residential or areas where people are working continuously.
CRI in the 80's is good and most commonly used for residential, most hospitality and retail applications.
CRI in the 90's is excellent and typically used in high-end retail, medical and other specialist applications.

Control Gear (Driver) - an electrical device which regulates the power delivered to an LED light source (or sources) to ensure its correct operation.

DALI - Digital Addressable Lighting Interface is a digital signalling protocol for controlling and dimming lighting in buildings. An open standard that was developed as a successor to analogue 0-10V lighting control systems. The advantage of digital dimming is that fixtures are addressable and there can be many more levels of light output.

Dimmable - the capability of a light source's lumen output to be varied while maintaining flicker free and reliability operation.

Emergency Lighting - lighting that switches on automatically or continues working in the event of a mains power failure, powered by a rechargeable battery or central battery system.

Emergency Luminaires - all Fusion emergency luminaires comply to the relevant parts of EN61000:200 and EN55015:2006 and are rated for 3 hour autonomous battery operation. Fusion emergency luminaires operate in "maintained" mode, unless otherwise stated or specified. In

maintained mode the LED light engine operates with a normal power supply and switches to the emergency power supply when there is a failure of supply. It is recommended that emergency lighting applications comply with EN1838 and EN60598-2-22.

Flicker - the rapid variations in light intensity emitted from a lamp, caused by AC operation and that can lead to strobe effects.

Forward Voltage - the voltage developed across the LED diode when an external current is passed through a device.

Heat Sink - a thermally conductive metal device designed to absorb and disperse heat away from an LED chip or array. Because LEDs are sensitive to heat, a heat sink is often a crucial part of LED luminaire design and helps to preserve the lifespan of LEDs.

Incandescent Lamp - a light source (light bulb) that generates light from a thin filament wire (usually of tungsten) heated to white heat by an electric current passing through it.

Illuminance - the light level on a surface, measured in lux(lx).

Indirect Lighting - the method of lighting a space or room by directing the light from a luminaire or luminaires upwards towards the ceiling. The light reflected off the ceiling usually produces a soft, diffuse illumination for the area.

Glare - the visual discomfort caused by high luminance (excessive brightness) in the field of vision. Glare can be direct or indirect (reflected).

Goniophotometer - a photometric device for measuring the luminous intensity and distribution of light emitted at different angles from a light source .

Kelvin - a unit of temperature starting from absolute zero, parallel to the Celsius (or Centigrade) scale. 0°C is 273°K.

LED - Light-Emitting Diode - a semiconductor diode that emits light when conducting current and is used in electronic equipment and lighting.

LED Array - a matrix or assembly of LED packages on a printed circuit board or similar possibly with optical elements and additional thermal, mechanical and electrical interfaces that are intended to connect to the load side of an LED driver.

Light Output Ratio (LOR) - the ratio of the luminaire light output to lamp light output. The efficiency of the luminaire.

Light Pollution - light that is emitted or reflected in directions where it is not needed, and thereby interferes with some visual act. Light pollution into the sky creates a "dome" of wasted light and makes it difficult to see stars above cities.

Lumen (lm) - unit of luminous flux used to describe a quantity of light emitted by a source or received by a surface.

Lumen Maintenance - a measure of how well a lamp maintains its light output over time. It may be expressed numerically or as a graph of light output vs. time.

Luminaire - the correct term for what is generally called a light fitting or fixture. A luminaire is the apparatus containing the light source.

Luminaire Efficacy - a measure of the overall efficiency of a luminaire. The luminaire luminous output in lumens divided by the system power ie the total power consumption of the fitting including control gear etc

Luminaire Efficiency - the ratio of light output emitted by the luminaire to the light output emitted by its lamps.

Luminance - the measure of 'surface brightness' when an observer is looking in the direction of the surface. It is measured in candelas per square meter (or per square foot).

Luminous Flux - the measure of the perceived power of light, adjusted to reflect the varying sensitivity of the the human eye to different wavelengths. The SI unit of luminous flux is lumen (lm).

Lux (lx) - a unit of illuminance or light falling onto a surface. One lux is equal to one lumen per square meter

Macadam Steps - method of quantifying colour consistency and, in particular, how the human eye distinguishes white colours. If the chromaticity co-ordinates of a set of individual Led diodes or lamp sources are within 1-step MacAdam ellipse, the majority of the population would be unable see any deviation in colour. If the chromatic co-ordinates extend to a larger area eg 2 or 3-step chip, more people would start to see some small colour variation. With a 5 step LED, the colour variation would be clearly visible to a normal sighted person. For 'real world' architectural lighting, a 3-step LED installation would display little colour variation and a 2-step installation would display no perceptible colour variation.

Part L1 & L2 - UK Building Regulations for conservation of fuel and power.

Polar Curve - the graphic representation of the luminous intensity in different directions. If two curves are plotted, the distributions are in two vertical planes. The value is indicated in candelas per 1000 lumen (cd/klm) and therefore must be multiplied by the nominal luminous flux of the lamp used. The polar curve graph also indicates luminaire efficiency.

RGB - stands for red, green, and blue - the three basic colours of light. **LED** products can combine these three colours to produce both white light and over 16 million colour hues. LED light sources do not need to be shaded to produce different colours, so are more energy efficient.

Task Lighting - additional lighting provided to assist in performing a localised task, e.g. a desk lamp for reading.

Watt - unit of electrical power. Lamps are rated in watts to indicate the rate at which they consume energy.

UGR (Unified Glare Rating) - the UGR rating relates to glare from ceiling fixtures that are placed in a regular pattern. It is a measure of luminance of visible lamp(s) divided by the background luminance / illumination of the room or space. Hence the actual or perceived glare experienced depends not just on the luminaire but also on the luminaire layout and room environment. European standard EN 12461, Lighting of Indoor Work Places, contains a table in which the maximum allowed UGR value is prescribed per type of room and per type of activity. The UGR method produces a scale figure:

< 13 : No glare
13-16 : suited for accurate eye tasks
16-19 : suited for average eye tasks
19-22 : suited for moderate eye tasks
22-28 : suited for simple eye tasks above
28 : Not suited for work lighting