LED Information Sheet

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LED Supply Voltage Requirements

Aqualux LED fittings have been standardised around a 12VAC power supply requirement. This makes integration into existing outdoor lighting setups straightforward. Some LED light fitting suppliers argue that 24V or higher is required - Aqualux utilises state-of-the-art Voltage Boost drivers in fittings where a higher input voltage may have been required, again resulting in a standard 12VAC supply requirement.

All Aqualux LED fittings can be powered with 12 - 30V, AC or DC.

LED Output Power

When high-power LED light fittings first became available, it was common to refer to the different powers available in terms of 'watts'. For example, the first generation of general lighting LED's are referred to as "1W" LED's, the second generation referred to as "3W". This was primarily done in order to provide a comparison to conventional halogen or incandescent bulbs. However using watts is a misleading way of describing LED output, as the present generation of LEDs demonstrates, you can have an LED that uses 2W buts puts out more light than a "3W" LED! The most accurate form of comparison is to describe LED's in terms of overall efficiency, or Lumens per Watt. This allows for accurate comparison to other light sources and between different generations of LEDs.

Does using AC or DC make a difference?

Most LED's require a constant DC current source. Early high-power LED light fittings required external drivers that provided a constant current output which LED light fittings were connected to in series. These days, all Aqualux Lighting products have built in driver technology that converts the input source to a constant current DC output. The difference in output current when using DC input rather than AC is approximately 10mA, little enough to make no difference in perceivable output or LED lamp life. The driver technology we utilise in our product is of ultra-high quality and ensures maximum possible LED lifespan.

LED Lamp Lifetime

Stated LED lifetime is usually in the realm of 50,000 hours. This represents (in the case of CREE LED's) the period of operation before the output is reduced to approximately 50% of it's original level. The key to obtaining the stated lifetime is to ensure adequate thermal design in the product, something that all Aqualux products achieve.

Colour Rendering Index (CRI)

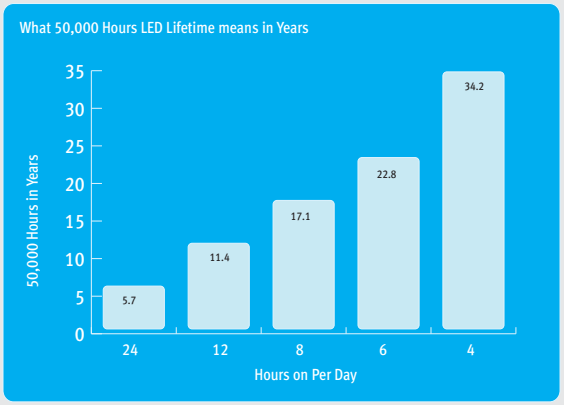
Colour Rendering Index (or CRI) is a representative measure of how accurately a certain light source represents the colours and objects it illuminates. A burning filament, such as an incandescent bulb, has a high CRI of nearly 100. A monochromatic source, such as the orange sodium-vapour street lights, has a low CRI of almost 0! You can imagine the difference of how a photograph might appear under those varied light sources! LED's have traditionally had quite low CRI's of around 50, however the latest generation of LED's, including those from CREE that Aqualux uses, have much higher CRI's of around 89, close to that of a halogen bulb.

Primary & Secondary Optics

Most high-power LED's have a primary optic that is attached directly to the MPCB on which the silicon is mounted. In addition to this, for applications such as general lighting, and in all Aqualux products, a secondary optic is also utilized, which refocuses the light into a more useful beam. By changing the secondary optic, you can achieve different beam patterns for different applications.

How an LED works

LED's are very different technology to traditional halogen or even fluorescent lighting systems. An LED consists of a silicon semiconducting material, similar to what is used to make modern microchips. The silicon is "doped" with impurities (such as gallium arsinide) to create a p-n junction, or diode. When a current is applied to the diode, electrons flow across the junction, losing energy equivalent to the "band-gap" determined by the doping material, and emitting photons in the process. Hence the term "light emitting diode".



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