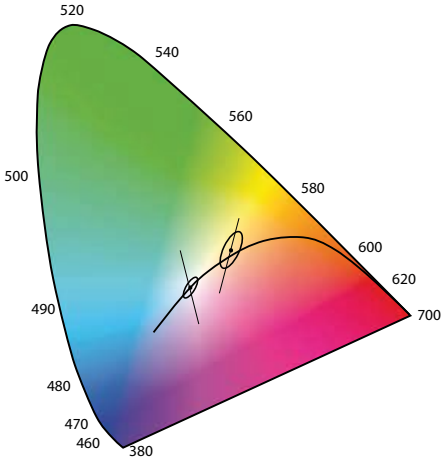
The lighting industry is going through a revolution and as we have witnessed in a few short years, LED technology has now leapt ahead. LED luminaires are no longer tucked away providing accent lighting in dark corners, LEDs are now a practical option for a wide range of applications.

Offering high light flows, excellent economy, and a typical lifespan of between 50,000 and 70,000 hours, LEDs are here to stay. It's time to do the sums and find out how you can best benefit from the new technologies available.

Understanding LED technology



Consistency is critical

It's critical that users get a consistent quality of light from their light source.

The light source within an LED is a semi conductor. The nature of the process by which semi-conductors are made leads to wide variations in colour temperature between different LEDs. Manufacturers sort their products into bins according to their colour temperature performance. The fewer bins your LEDs come from, the more consistent the light you will get from them.

Another issue to be considered is the degree of deviation in colour temperature in the product. This is known as chromaticity, and is measured in MacAdam ellipses. The MacAdam system ranks colour quality on a scale of 0 to 10. At the higher end of the scale you can see clear differences in certain applications, particularly when lighting a white surface or when an LED strip is near a white wall. It is recommended that LEDs for indoor applications should be below MacAdam 5 SDCM

100% LOR – Absolute Photometry

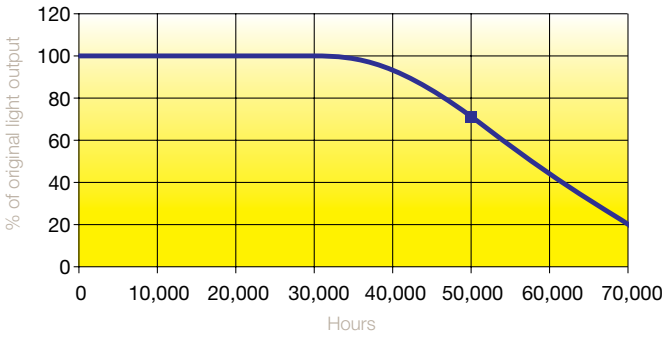
Absolute photometry is the method of measurement described in the American standard LM79 for luminaires with an LED as a source of light. Due to the lack of an approved European standard, LM79 is being widely adopted by companies in countries that lack their own standard.

The standard refers to absolute output from the fixture rather than the traditional relative method of measuring lamps alone, and then comparing the output figure to the output of the lamps when it is within the luminaire. Therefore, the luminaire under test will be shown to have an LOR of 100%.

The reason you cannot measure an LED or an array of LED in isolation as you would a conventional source is due to the fact that the LEDs need to be mounted on a material, which will determine the operating temperature of the LEDs. The operating temperature will contribute to the output of the luminaire.

Establishing the life of an LED Luminaire

A well-designed LED luminaire made with high quality parts and rigorously tested thermally to ensure the LEDs, electronic components and drivers are not thermally stressed will have a lifespan of 50,000 to 70,000 hours. That is equivalent to 15 – 20 years in a building lit for 9 hours a day. Unlike conventional lighting, an LED does not fail suddenly as it burns out. Instead, the light flow reduces over time, with the end of the luminaire's lifespan defined as the point at which this reduction reaches 70% of the original output. As with any electronic item, there will of course be the occasional failure.



Zhaga

Whitecroft Lighting Ltd, as part of the Fagerhult Group of Companies is one of the founding members of Zhaga. Zhaga is an industry-wide cooperation between companies aimed at enabling the interchangeability of LED light sources made by different manufacturers. Interchangeability is achieved by defining interfaces for a variety of application-specific light engines.

Zhaga specifications cover the physical dimensions, as well as the photometric, electrical and thermal behavior of LED light engines. The introduction of Zhaga specifications is an ongoing process and as such there will be a number of compliant and non-compliant LED modules in the lighting industry.