



Avlite[®]
www.avlite.com

LED Technology: the perfect lighting solution





Compact Lights make a Big Impact!

Avlite's aviation lights use LED (Light Emitting Diode) technology as their light source. The advantages LEDs have over traditional incandescent lighting have made Avlite's aviation lights one of the most cost efficient and reliable lights available today.

The LED was first invented in Russia in the 1920s but practical use of them was not made for several decades. In recent years, as LED technology has become more advanced, the light output and efficiency have been increased making them a viable option for lighting applications.

Early LEDs only emitted low-intensity red light, however, modern LEDs have been developed to emit light across the visible, ultraviolet and infrared wavelengths, with a high level of brightness.

LEDs are more energy efficient and will outlast traditional bulbs by many tens of thousands of hours.

As a viable alternative to the incandescent bulb, the LED offers numerous benefits over conventional lighting methods.

Energy Efficient

The main advantage of LEDs is their efficiency.

Incandescent bulbs create light via a filament which is heated by an electrical current running through it. Once the filament gets to a high enough temperature it glows producing visible light. This process is highly inefficient with as much as 98% of the energy input lost in the form of heat.

In contrast, LEDs generate very little heat resulting in a much higher percentage of the electricity being used to generate light. Up to 80% of electrical energy is converted to light with only the remaining 20% being lost through heat, leading to dramatic energy savings.

Long Life

LEDs have a long service life of approximately 100,000 hours compared with incandescent bulbs which have a life span of only 1000-2000 hours.

An LED can operate continuously for 11 years or 22 years at 50% operation. As a testament to their long life, many LEDs which were produced in the 1970's and 1980's are still operating to this day!



Compact Size

LEDs are very small in size. They are basically just tiny bulbs that fit easily onto printed circuit boards.

Their small size provides greater design flexibility and Avlite has taken advantage of this to produce aviation lights which are compact without compromising on performance.

LEDs are able to be arranged in rows, rings, clusters or individual points. An example of this is the Avlite AV425 in which 16 individually controlled LED drivers within the light optic allow the fixture to operate as an omnidirectional or bi-directional light and even as a rotating beacon.

Durability

Unlike incandescent lighting, LEDs are housed in a plastic casing and do not have a fragile filament which can be damaged by vibrations making them a lot more durable. LEDs are also resistant to heat, cold and shock making them ideal for aviation lighting applications.

Cost Savings

There is no comparison between the cost of LED lighting and incandescent options. Although LEDs are initially more expensive than incandescent globes the long term cost savings of LEDs are significant.

The true cost of incandescent bulbs is in the expense of replacement bulbs, and the labour and time needed to change them. LEDs can last for over a decade without the need for replacement.

Lower maintenance costs coupled with reduced energy consumption make LEDs a cost effective solution for aviation lighting.

Flash Characteristics

LEDs light up extremely quickly and achieve full brightness in microseconds making them ideal for aviation lights which require various flash patterns.

LEDs can be easily dimmed by reducing the electrical current supplied to them, however, this has the unwanted side effect of altering the colour output of the light. Avlite has developed software that is able to dim the light while retaining the LEDs true colour.

This is done by using Pulse Width Modulation to make the LED flash at full intensity at speeds which are not visible to the human eye giving the illusion of a dimmer light. This application is particularly useful in areas of low sunlight because it reduces the power consumption of the solar light to extend the period of time the light is operational while maintaining the light's true colour.



LEDs are housed in a plastic casing and do not have a fragile filament



LEDs are able to be arranged in rows, rings and clusters



LEDs achieve full brightness in microseconds



Lens Design

Avlite lenses are designed specifically for use with LEDs to give superior optical performance.

Both the internal and external profiles of the lenses have been designed to maximise light intensity while minimising power consumption.

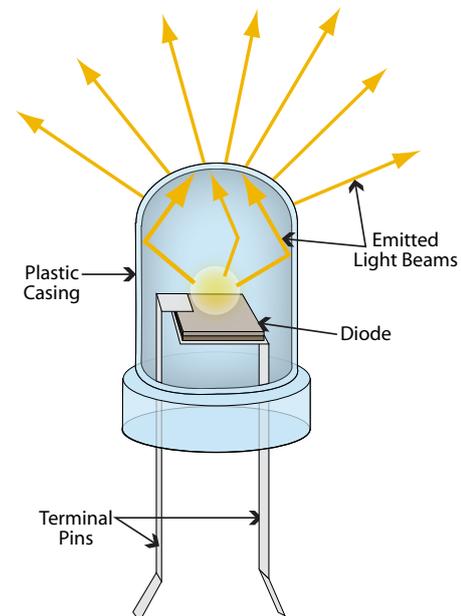
Made from UV-stabilised Lexan® polycarbonate, the lenses provide accurate colour output and will not discolour over time.

LED Colour

The different colours of LED lights are not produced by the traditional method of using coloured filters or lenses. The colour of the LED is based on the chemical composition of the LED die.

The most common elements used in diode construction are aluminium, arsenide, gallium, indium, phosphorus and nitrogen. The colour light the LED emits is determined by the different combinations and proportions of these elements.

Colour Name	LED Die Material
Infrared	Gallium, Aluminium, Arsenide
Red	Gallium, Aluminium, Arsenide
Yellow	Gallium, Arsenic, Phosphide
White	Silicon, Carbide, Gallium, Nitride
Green	Gallium, Phosphide
Blue	Silicone, Carbide, Gallium, Nitride



Eco-friendly

LEDs produce substantially less Carbon dioxide (CO₂) emissions than traditional incandescent globes.

A single kWt of electricity generates 1.34lbs of CO₂ emissions.¹ If we assume the average light bulb is on for 10 hours a day and runs off mains power, a single 40 watt incandescent bulb will generate 88.9kg (196lbs) of CO₂ every year. Over the same time span, the 3.9 watt equivalent (used in a two tiered SL125) will only be responsible for (8.8kg) 19.4lbs of CO₂ when run off mains power. That is approximately a 90% reduction in CO₂ emissions!

As Avlite's range of lights are able to run using solar power, this completely offsets all CO₂ emissions!

LED's are also non toxic and contain no hazardous mercury or halogen gases.

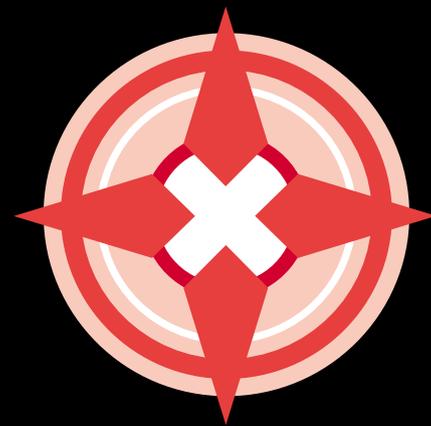
References:
 1. US DOE EIA: Electricity Emission Factors - http://www.eia.doe.gov/oiaf/1605/emission_factors.html
 Retrieved on - 10 July 2009



LEDs produce less carbon dioxide than incandescent globes

All Avlite Systems products are manufactured to exacting standards under strict quality control procedures. Avlite's commitment to research and development, investing in modern equipment and advanced manufacturing procedures has made us an industry leader in solar aviation lighting.

By choosing Avlite Systems you can rest assured you have chosen the very best.



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AV70 solar aviation light



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