

The age of enlightenment



Philips AmbientLED light bulb

As halogen's glow slowly dims, LED is fast becoming the illumination choice for many new homes. ROGER HUNT sheds some light on the latest offerings



According to the Lighting Industry Association, LED lamp sales are currently growing at around 50% year on year. Indeed, with energy savings of 80% or more being achieved when compared with traditional incandescent or halogen lamps, and lifespans of at least 40,000 hours claimed, it would seem to be just a matter of time before LED technology is mainstream.

At Sylvania, part of the Havells-Sylvania Group, Edward Lees, strategic business unit manager of LED lamps, believes that LEDs more than pay for themselves over their lifetime. "As a typical example, based on 1,000 hours per year burning roughly three hours per day, a replacement LED lamp will pay for itself in around two years and continue saving for many afterwards."

Although the capital cost still deters some housebuilders, the price of LEDs is dropping and, having rapidly evolved, the lamps are now capable of offering good quality instant light, unlike compact fluorescent lamps, which are slow to start and only achieve full output over time. LEDs also provide great design flexibility, making them popular with designers and specifiers. The lamps are now available as replacements for most lamp types including linear strips, spotlights and traditional bulbs such as the Edison screw and bayonet.

"Because of the small size of this technology, it's possible to create new lamp types which use LED chips in ways not possible with other light sources. A single LED chip with an optic lens can create a miniature spotlight," says Luke Thomas, senior designer at John Cullen Lighting.

Edward Lees points out that LED technology is continually improving, with more light being generated from lower wattages. "For example, the first LED alternatives to GU10 50W halogens claimed an equivalent wattage figure of 8W, and were much larger in size than their traditional counterparts, but new versions now run at around 5W and are much closer in size and shape to the halogen version."

The relationship between wattage and light output is not necessarily clear-cut. "In September 2013 new regulations were introduced by the EU giving guidelines on how lamp equivalence has to be shown on any lamp packaging," explains Lees. "All bulbs

THIS PAGE

BELOW LEFT Sylvania LIFX lamps

BELOW RIGHT & THIS PIC Osram LED lighting in use

OPPOSITE PAGE

BOTTOM LEFT Osram LED LIGHTIFY – selecting colour

BOTTOM RIGHT MK Elements Collection dimmers

RIGHT Osram LED lighting can be used in a wide range of settings



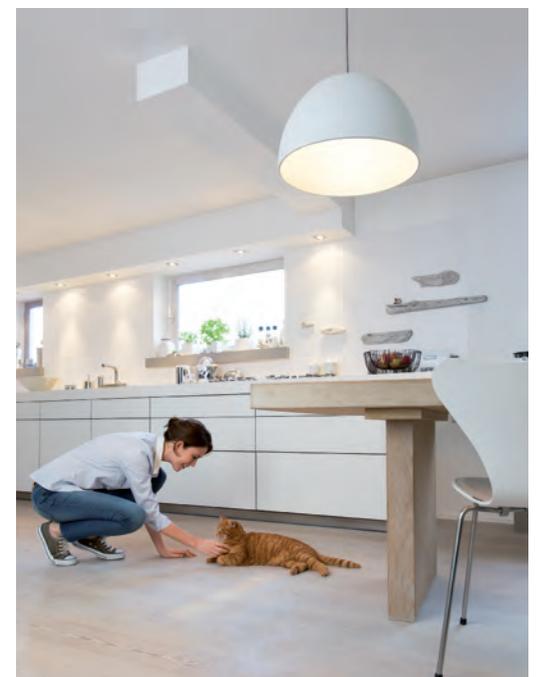
sold in the EU now have to carry an energy label to show how efficient they are and include the lumen-to-wattage equivalence figure."

A lumen is a measure of the quantity of light emitted from a bulb. With non-directional bulbs, the lumens measure the total light emitted in all directions. For directional bulbs, such as reflector lamps, it is measured by the useful lumens, the amount of light coming out forwards from the front-facing part of the bulb.

"The reason for the change of measurement on the packaging is because watts only tell you how much power the bulb consumes, not how much light it generates. Lumens will tell you what you actually

need to know, how much light you will get from a bulb, and it's an easier means for comparing the amount of light you will get from one bulb versus another. For example, a 60W incandescent produces 700 lumens, but an LED equivalent lamp produces 806 lumens from just 8.5W. Even an equivalent compact fluorescent lamp uses 11W but produces only 600 lumens," explains Lees.

Another important consideration is colour. LEDs offer the choice of warm or cool white colour temperatures, explains Michael Linsky, managing director of lighting solutions company Sensio. "Whereas LEDs were once criticised for producing a cold, blue light, this is no longer the case. In fact,





opting for a warm white light will provide a yellow glow similar to that produced from halogen bulbs.”

It is generally agreed that a good colour temperature for use in a house or garden is 2700K as this is a warm white colour. Another factor is the CRI (Colour Rendition Index), which gives an indication of how an artificial light source will reproduce colours in comparison to a natural light source – daylight. According to Thomas, colour rendering is a characteristic that LEDs have traditionally struggled with, although recent improvements have closed the gap on halogen. “The maximum value that can be achieved is 100 but anything below 90 can make colours seem very

“With every generation, colour rendering is improving. Current high-spec LEDs are hitting 90% accuracy, only 8% behind incandescent. This will only get better”

grey, lifeless and flat. The best LEDs will now have a CRI of 95 or above.”

Craig Thorne, Philips Dynalite product manager at distributor AWE, points out: “With every generation, colour rendering is improving. Current high-spec LEDs are hitting 90% accuracy, only 8% behind incandescent. This, with time, will only get better.”

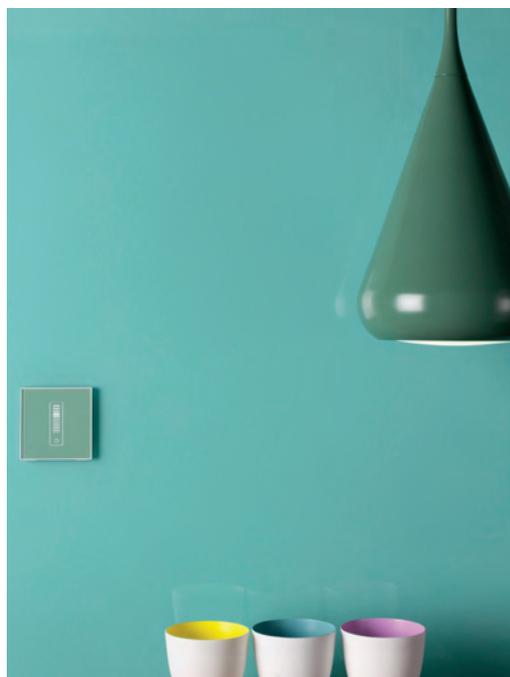
One of the claims made by LED manufacturers is that their product will last an incredibly long time, often 35,000-75,000 hours. “Some buyers may be unsure about the validity of these statistics but, if the product is used under the correct conditions, they should be accurate,” says Thomas. “As with all light sources, LEDs will gradually degrade over time and the light output will reduce. Values of life expectancy will be the time it takes for the LED to reach 70% of its original light output.”

One of the main factors that can affect the life of an LED is the operating temperature. If the LED gets hotter than the manufacturer’s recommendation it will accelerate the breakdown and the LED will burn out much quicker than it should. Heat can also distort the colour temperature of the LED.

Probably the biggest issue with LEDs is the question of dimming. LEDs can be dimmed but compatibility between the lamp and the dimmer is key warns John Cullen’s Thomas. “Many manufacturers publish a list of the dimmers and drivers that they claim their LED will work with and that they have tested. If you don’t use equipment that is from their list you run the risk of flickering or pulsing lights.”

Flickering is a particular issue, especially at minimum dim levels. Another major problem is that incompatibility between an LED lamp and dimmer can cause unreliable dim levels so the dimmer’s minimum brightness can range from ‘overly bright’ to ‘invisible’.

Jason Ng, MK Electric marketing specialist, lists the compatibility issues. “Firstly many existing dimmers, designed for incandescent or halogen lamps, will not ▶



BELOW John Cullen Lighting products and lighting schemes; Metal Cube and Oslo LED
MIDDLE LEFT Sensio LED kitchen lighting
MIDDLE RIGHT Osram LED product range
BOTTOM LEFT John Cullen Lighting products and lighting schemes; LED Luca
BOTTOM RIGHT John Cullen Lighting can offer a variety of lighting solutions



work properly with the majority of LED lamps. Secondly, there is no standard across the industry that regulates the performance of the dimmable LED lamps developed by manufacturers. Finally, some lamp manufacturers are producing dimmers that are only compatible with their own lamps, instead of ensuring the product will also dim lamps from other manufacturers."

Unlike incandescent lighting, which, once turned on, requires the same current as long as voltage remains constant, the construction of many dimmable LED lamps means that this is not the case when used with a dimmer. As a result, the dimmer can easily be overloaded, which may lead to blown fuses, dimmer failure or even fire.

According to Jason Ng, MK Electric is addressing these issues and its latest LED dimmer offers compatibility with many of the incandescent, halogen and dimmable LED lamps from leading manufacturers. In addition, it allows flickering to be addressed without replacing a lamp, by adjusting the minimum dim level using the product's dimmer knob.

Similarly, at AWE, Craig Thorne claims that with Philips Master LED lamps, flicker-free dimming is guaranteed with all the main dimmer brands, although for best results a fully dedicated control system, such as Philips Dynalite, is advisable.

Control of LEDs is moving beyond simply controlling the lamp's brightness. Sylvania has partnered with LIFX, an internet kickstarter, to offer a wifi enabled LED lamp that can be controlled with a smartphone. This allows users to choose from 16 million colours and to select the brightness and dimming levels of their LIFX lamps as well as create scenes. Soon an

app will enable features such as alarm linked automatic control as well as controllability of the LIFX lamps from anywhere in the world.

Similarly, Osram is launching LIGHTIFY. This permits intelligent wireless networking and control of smart LED lamps from a smartphone or tablet PC. Using the LIGHTIFY application, light sources can be individually switched on or off, dimmed, activated for a defined period or adapted to personal color preferences. Users can also remotely access information on the power usage of the lamps for better control of energy consumption.

Steve Stark, Osram UK's trade sale director, points to the fact that it has been said that "today we are selling our last light bulbs, as consumers know them". He concludes: "With an evolving technology like LED it's difficult to say what the future will hold but, here and now, there are some exciting new home lighting technologies about to be launched." [sh](#)

CONTACTS

AWE www.awe-europe.com

Havells Sylvania www.sylvania-lamps.com

John Cullen Lighting www.johncullenlighting.co.uk

Lighting Industry Association www.thelia.org.uk

MK Electric www.mkelectric.com

Osram www.osram.com/lightify

Sensio www.sensio.co.uk

Read Roger Hunt's blog www.huntwriter.com and follow him on Twitter @huntwriter

