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LED lighting: from accent to everywhere

Consumer expectations for good lighting have become commonplace today, and we often take good lighting for granted. For instance, we expect to have our roads and pathways well illuminated, and the notion of councils switching off street lights can open up much debate about fears of safety, or how efficiently emergency services can respond in the dark.

But in the current economic climate, the expense of maintaining street lights can quickly come under review by local councils who wish to save money and meet energy savings criteria. However, switching off seems a less than ideal solution, which prompts the question: is there a better alternative?

This is where LED lighting may well come to the fore. Advances in light-emitting diode (LED) lighting systems in recent years have driven the technology from indicator to illumination applications, and it is fast moving from novelty use in accent and decorative lighting (think tangled Christmas lights) to becoming the light source of choice for most lighting applications.

Why? Firstly, because LED lighting is so flexible in use. With increasing light output and system efficacy, coupled with a wide range of shapes, sizes and form factors suitable to various optics and light distribution solutions, LED lighting is becoming an adaptable choice for the lighting of structures and street scenes and the provision of general and task lighting in buildings.

Secondly, LED lighting that is properly specified and installed can have a host of benefits relative to counterpart technologies in terms of reliability, safety, longevity and maintenance. In particular, it can be switched on and off (or dimmed) frequently without its lifespan being reduced. It can also lead to reduced lighting pollution for external applications.

The installation of LED lighting is becoming to be perceived as a priority for many local authorities, with examples of the mass deployment of LED lighting systems already featuring in the news:

- In July 2012, Birmingham City Council celebrated the success story of installing 10,000 LED columns, with estimated savings in the cost of energy of £3 million annually with up to a 60 per cent cut in related carbon emissions: http://birminghamnewsroom.com/2012/07/city-is-shining-thanks-to-10000-eco-friendly-leds/.

- In December 2013, a ground-breaking project was committed to, to update street lights in London – proving that history, when it comes to street illumination, is still being made: http://www.localgov.co.uk/London-commits-to-historic-street-light-investment/35132.

- As part of Sheffield's planned street improvement programme (the Streets Ahead scheme), 58,000 LED lighting columns are due to be installed: http://www.lighting.co.uk/wrtl-wins-sheffield-led-street-lighting-contract/8635418.article.

- After winning £24 million in the Future Cities competition, Glasgow will be showcasing how UK cities can make the most of new technologies by integrating LED lighting with smart city systems, pairing remote sensors that track traffic and footfall with improved lighting control: http://www.glasgow.gov.uk/index.aspx?articleid=9647.

While capital cost has previously been a barrier to the deployment of LED lighting systems, component costs are coming down and available product ranges are growing as the market

matures. LED lighting is expected to dominate street and commercial lighting in the coming years, with domestic applications following shortly thereafter, perhaps as soon as 2020. However, as with all new technologies, the transition to LED lighting is not without serious considerations.

When applying LED lighting systems, it is crucial that care is taken over the appropriate design, specification, installation and maintenance to ensure that all key considerations have been identified, checked and effectively managed. Given that this is a relatively new market, there is still great variation in LED lighting product quality, and some products can be inconsistently or misleadingly labelled, leading to difficulty in comparing systems' performance. LED lighting systems can have reduced performance in higher temperature environments, so designers and installers should ensure that the LED junction temperature is kept within the specified operating tolerances. The application of LED lighting systems in both new and retrofit situations can also present compatibility issues, particularly between LED lamps, drivers and lighting controls or dimming, where the latter are used.

As a result, the first challenge for those wishing to install LED lighting may be where to start – the technology is growing at so rapid a pace, and a clear understanding is required to really make the most of an LED lighting system. It is therefore crucial that alongside this growth in technology there is a growth in the skills base of installers and maintainers and increased designer and specifier awareness of the range of options that LED lighting systems can provide.

LED lighting is arguably the lighting solution of the future, but for now it remains important to properly manage the challenges presented in the application of this new technology.

Further information:

The IET have developed the *Code of Practice for the Application of LED Lighting Systems* to address the performance, safety and longevity issues of LED lighting installations using a systems approach to practitioner considerations, such as lighting design, physical installation, electrical design and installation, commissioning, inspection and maintenance. The Code of Practice will be essential reading for anyone involved in designing, specifying, installing or maintaining interior or exterior LED lighting systems. For more information, please click visit http://www.theiet.org/resources/standards/led-cop.cfm.

In addition, **the IET Built Environment Sector Summit: Lighting** (9th April, Central London) will provide practitioners with an update on key developments in the lighting applications market, including such topics as:

- standards, regulation and compliance (eg the new Part L to the Building Regulations);
- advances in how buildings and environments can be lit;
- how advanced lighting can be technically achieved and controlled;
- delivery energy efficient lighting schemes; and
- a Q&A panel on new and retrofit lighting applications.

Attendees will receive a copy of the *Code of Practice for the Application of LED Lighting Systems* as part of their delegate experience. For more information, please see http://www.theiet.org/events/2014/194624.cfm.