

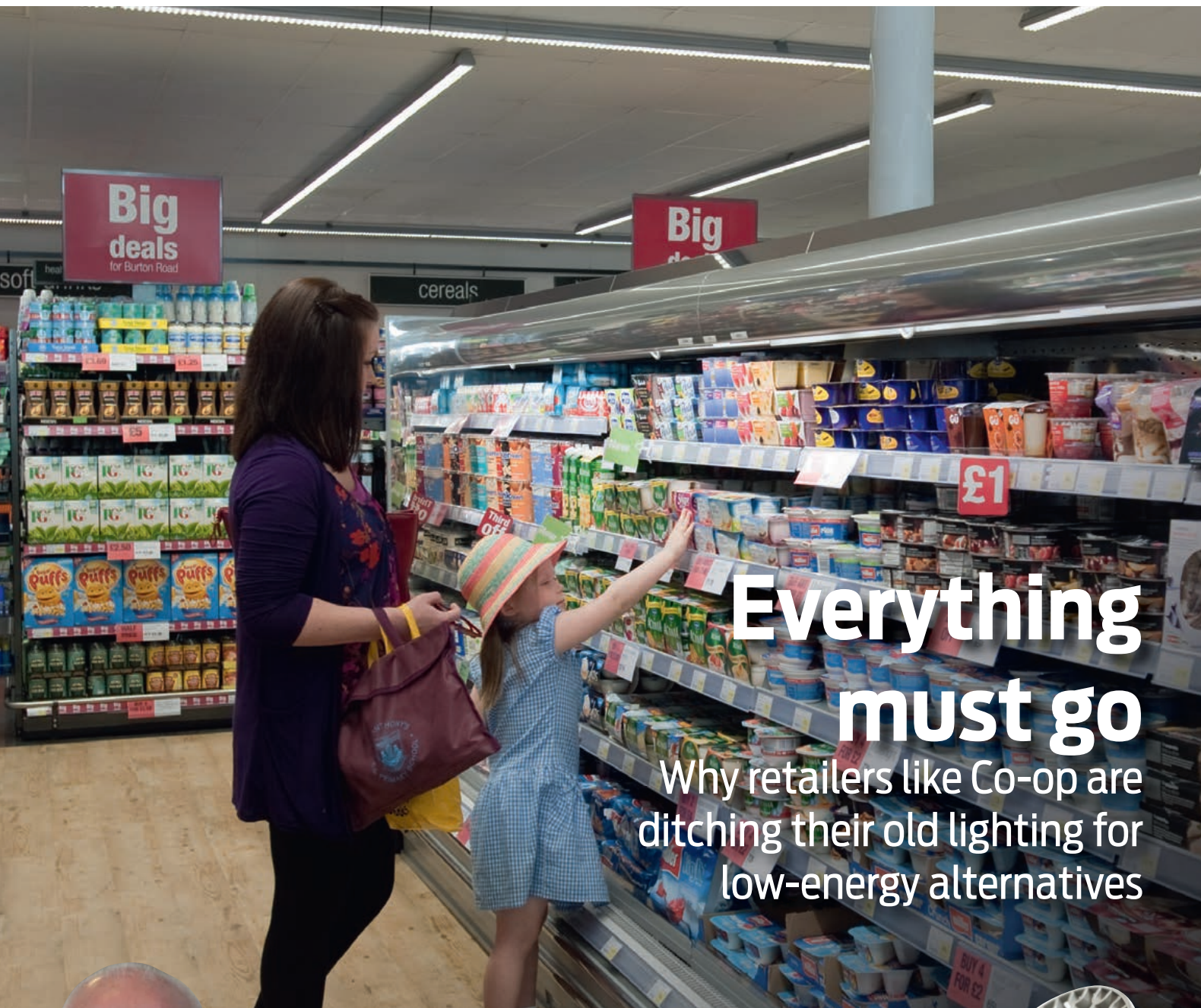


LUX MAGAZINE

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OFFICIAL PUBLICATION OF THE LIGHTING INDUSTRY ASSOCIATION



Everything must go

Why retailers like Co-op are ditching their old lighting for low-energy alternatives



MAN WITH A PLAN

King's College's energy manager reveals his lighting strategy

p36

LED LAMPS

We test the latest halogen replacements and pick the best

p28



PLUS: HOW DYNAMIC LIGHTING HELPS DEMENTIA PATIENTS

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Kids take over the cameras at this studio where the lighting is fun, dynamic and energy-efficient

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‘The staff seem to enjoy that they’ve got this lighting. It makes them feel the area they work in is a bit special’

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Robert Bain | Editor

e: robert.bain@luxmagazine.co.uk
t: 020 3283 4387
m: 07720 677 538
twitter: @lux_magazine

Pennie Varvarides | Assistant editor
e: pennievarvarides@luxmagazine.co.uk
t: 020 3283 4387

Ray Molony | Publisher
e: ray.molony@luxmagazine.co.uk
t: 020 3283 4387
m: 07834 990577

Lucy Wykes | Business development director
e: lucy.wykes@luxmagazine.co.uk
t: 0203 283 4387
m: 07803 504 320

Andrew Bousfield | National account manager
e: andrew.bousfield@luxmagazine.co.uk
m: 07713 567290

Bryan Beckham | Account executive
e: bryan.beckham@luxmagazine.co.uk
m: 07713 567288

Emily Crouch | Art editor
e: emily.crouch@luxmagazine.co.uk

Miriam Hier | Accounts manager
e: miriam.hier@luxmagazine.co.uk
m: 07882 224682

Judi Faithfull | Operations director, LuxLive
e: judi.fithfull@luxmagazine.co.uk
m: 07767 333085

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Revo Media Partners, 3 More London Riverside,
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Ground Floor
Westminster Tower,
3 Albert Embankment
London SE1 7SL
www.thelia.org.uk

e: info@thelia.org.uk | t: 020 7793 3020

Eddie Taylor | Joint chief executive
e: eddiet@thelia.org.uk

Peter Hunt | Joint chief executive
e: peterh@thelia.org.uk

John Huggill | Training manager
e: johnh@thelia.org.uk

For LIA training courses please visit www.thelia.org.uk

Getting better all the time

One of the many confusing conversations I had when I started at *Lux* last year was with a manufacturer who tried to explain to me how the advent of LEDs had made the life cycles of lighting products shorter.

'Shorter?' I asked. Aren't LEDs supposed to last longer than the stuff they replace? They do, he told me, but the technology is improving so fast that by the time a product hits the market it's

tends to double in power every 18 months or so – a phenomenon known as Moore's law. The result is that every time you buy a new laptop, the spec of the old one looks woefully out of date, even if it's still perfectly serviceable.

So when's the right time to buy? Sure, things will keep getting better, but if you waited for ever, you'd still be drying your clothes with a mangle.

Organisations such as Philips and the Zhaga consortium have sought to introduce some stability by coming up with LED light sources that can be replaced easily as time goes by, so users can benefit from improvements

in quality and efficiency without changing the lit effect.

In this month's issue Gordon Routledge examines life claims for LED products (page 34), Dave Tilley does the maths on buying now or waiting until later (page 85) and Eliot Horsman ponders how longer product lives might alter the lighting business (page 44).

What's certain is that expectations are changing. One lighting salesman told me recently of a client's anger when a new, better-performing luminaire was released less than a year after he'd shelled out for the previous version – which he'd been told would last for many years. Now he was going to have to upgrade again to get the latest version, he complained. Clearly there's no pleasing some people. 🇬🇧

'Early adopters are always going to feel pangs of regret when they see their friends get version 2.0'

practically obsolete already.

This person was speaking from a seller's point of view, of course. Buy a good quality LED product today and it will give you many happy years of light, but during that time the manufacturer will release several newer iterations that gradually leave your one looking a bit naff.

Of course, early adopters of new technology are always going to feel pangs of regret when they see their more patient friends get their hands on version 2.0, but that doesn't mean there's anything wrong with supposedly 'obsolete' light fittings – just as there's nothing wrong with the mobile phones we all replace every year or two with shinier ones.

LEDs have made lighting more like computing, where hardware

COVER: Philips
LED lighting at the
Co-operative Food
in West Didsbury

NEWS IN BRIEF

EU takes on LED tubes

LED tubes from five manufacturers were banned or recalled by authorities in the EU last year because they posed a risk of electric shock. Watchdogs in Finland, Germany and the UK banned tubes from Limic, Ledtek, Eneltec, Winled and lled.

● Join the discussion on LED tubes in the Lighting Talk group on LinkedIn

Leni gets thumbs up

Leni (the Lighting Energy Numeric Indicator) has met with a positive response in the government's consultation on proposed new Building Regulations. Of those who expressed a view, the majority were in favour of introducing the metric. The new regulations are expected to be published in April.

● See page 70 for more

LEDs power indoor GPS

A company in the US has come up with a way to use LED lights to provide a positioning service inside buildings. Lamps equipped with ByteLight's software transmit location data that can be picked up by smartphones.

CRC league table scrapped

Chancellor George Osborne has announced measures to simplify the CRC Energy Efficiency Scheme and scrap the league table that ranked organisations based on their carbon emissions. The government says the simplifications will reduce CRC costs by more than half.

LEDs 'damaging Van Goghs and other masterpieces'

LED lighting is darkening the yellow colours in famous masterpieces such as Vincent van Gogh's *Sunflowers*, say scientists.

The paint can slowly change colour, losing its vibrant yellow and becoming brown or olive green.

Scientists found that a pigment used in several famous artworks becomes unstable under some LED lights. A sample of 14 works from 1887–1890 was tested for the reaction, which affects a paint colour called chrome yellow, used during the Impressionist period by



artists such as Van Gogh, Gauguin and Cézanne.

Galleries have now been warned to stop using LEDs

until more research is done.

Claus Habfast of the European Synchrotron Radiation Facility in France, told *The Independent* newspaper: 'LED lights appear to have many advantages but museums should carefully consider that paintings from the Van Gogh era could be affected by them. It's not advisable to put these paintings in the dark because they are part of the cultural heritage of humankind and the public wants to see them.'

Museums have to strike the right balance.'

Toshiba closes UK office

Several people have been made redundant following the closure of Toshiba's UK lighting office. The company is seeking to cut costs and shift its focus to the B2B and wholesale markets.

François Séguineau, who heads lighting for Toshiba in Europe, told *Lux* the change resulted in 'a few' job losses. A slimmed-down sales force will remain in the UK but the business will be run from Germany by a team led by Günter Manske.

Philips recalls potentially dangerous GU10 LED lamps

Philips is recalling its top-of-the-range MasterLED GU10 lamp after reports that the lamp body could become live.

The company is withdrawing the mains voltage 8W MasterLED Spots from sale and recalling them from wholesalers. Potential current leakage can occur after 30 minutes burn time, and the lamp body may become live.

Philips said it had identified



the potential safety issue, which affects a limited number of the LED retrofit lamps that were primarily sold into the professional channel.

The company told *Lux*: 'Philips places great value on the quality of its products and wants to avoid potential risks. Therefore we decided to recall the affected lamps from the market and offer a similar replacement product instead.'



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Zumtobel pays up in faulty luminaires dispute

Zumtobel Lighting has been forced to pay £120,000 compensation and legal costs after a batch of defective luminaires was installed in car showrooms across the UK, it has been revealed.

Light on Line Limited, the supplier of the lighting equipment to the showrooms, sued the company along with another business,

Project Management Lighting Limited, for £240,000 after they undertook remedial work on the equipment.

Zumtobel admitted that the lighting it supplied was defective but denied that this caused the loss and damage alleged by Light on Line. Part of the claim by Light on Line was for services provided by them to Zumtobel to rectify the problem.

The parties agreed to settle for £120,000 and also agreed that the case – which was settled last July – would remain confidential, but the settlement came to light when a dispute over a costs claim for £350,000 led to a significant legal ruling on success fees for lawyers.

Both Light on Line and Zumtobel declined to comment on the matter.

Big potential for low-energy factory lighting

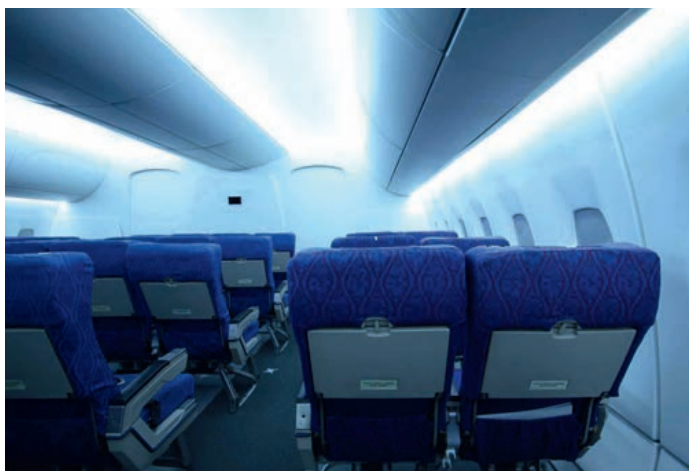
There is significant demand for low-energy lighting in the UK's manufacturing sector, according to a survey commissioned by GE.

The survey of 405 high-tech manufacturers, carried out in November and December 2012, found that more efficient lighting was the energy-saving option most likely to have been considered, beating off other measures such as insulation, solar power, and combined heat and power.

Overall, about half of the businesses questioned said they had considered some kind of power-generation or efficiency measures to make their energy supply cheaper and more secure. Eighty-one per cent of those that had thought about such changes had considered lighting.

Energy use was a key concern – with 84 per cent of the manufacturers surveyed saying they were worried about rising energy costs. However, less than half voiced concern about carbon emissions.

On the whole, the survey found the sector 'cautiously upbeat', GE said. UK CEO Mark Elborne said: 'The UK has a strong manufacturing heritage and there is good potential to build on this.'



A study has revealed that biodynamic LED lighting on overnight flights can improve the quality of passengers' sleep, leaving them feeling more alert on arrival. The research by Airbus, Diehl Aerospace and Osram, together with the University of Wuppertal and the Fraunhofer Institute for Building Physics, found that changes in the colour and brightness of light makes passengers feel better – especially on overnight flights.

Thirty-two test subjects took part in simulated long-haul flights in a model aircraft cabin (pictured) at Diehl Aerospace in Nuremberg. Researchers found that warm light at the beginning of the flight encouraged passengers to sleep, while cool light on arrival helped them wake up.



'Why pay for the skills of a lighting designer if you're only going to downgrade the luminaires based on price and not performance?'

Lorraine Calcott page 26



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President's briefing

Rune Marki, managing director, Osram UK and president, Lighting Industry Association

A world of opportunity

2013 will give the lighting industry plenty of opportunities to grow and evolve

The new year is starting off with a focus on legislation and regulation. Many column inches will be written on the details of these legislative changes, but let's keep in mind how positive they can be in shaping our industry for the future, and the opportunities they bring. These changes give the end user more knowledge and confidence about product requirements and quality.

The ErP (Energy-related Products) Regulation on directional lighting has now come into force. This will lead to the phase-out of less efficient directional lighting products. The first step takes effect from 1 September 2013, covering types such as incandescent reflector lamps and the least efficient GU10 halogen types, and the last stage of the phase-out will be in 2016. Manufacturers will be working hard to implement these changes and advise the market on the affected products at each stage.

Towards the end of 2012 the Department of Energy and Climate Change opened a consultation on ways to reduce demand for electricity. This highlights again how important energy efficiency is as an element of the government's overall energy policy. Encouraging users, both domestic and professional, to use less energy through improved usage, better insulated buildings and more efficient products has already contributed in recent years to significant energy and carbon reductions. The consultation recognises that much more is possible and lighting products and systems are seen to have a lot to offer, in domestic, commercial and industrial applications.

The LIA will be making a full response to the consultation on behalf of its members, so please send your comments to them – details of the consultation can be found at www.thelia.org.uk.

As an industry we know that good lighting is about more than just energy-efficient products. The LIA continues to promote the message that policy must recognise the importance of the quality of the design and installation of lighting schemes, lighting systems as a whole, and making sure that products deliver the performance they claim they will.

Technological innovation is another big opportunity for 2013, with new products coming to



market at a phenomenal rate. Many are LED-based, but other sources such as OLEDs, plasma and so on, are also having an impact, generating a lot of interest and opportunity for manufacturers, their clients and supply chain partners. Technology innovation is not without a few associated risks such as shorter product life cycles and new players – but that will certainly keep us all on our toes.


2012 proved to be a year of many successes for the industry, even though market conditions were not at their best. There were some great events with fantastic lighting displays, including the Olympics, which aimed to inspire a young generation.

Reaching out to the youth of today to encourage a career in lighting is a concern of the LIA and for our

'I believe our industry's image as innovative and high tech will continue to attract well-qualified young people'

industry. With the high visibility of lighting solutions in the last year there are many examples to inspire a new generation of lighting professionals. Last month I mentioned the launch of www.delightinlight.co.uk for the LIA Student Design Award scheme, but are we doing enough to educate young people into the benefits of a career in lighting? Let's take this as another opportunity for each of us to encourage those around us to look into lighting.

LuxLive 2012 demonstrated yet again the market interest for the potential of innovative lighting to improve their businesses. It also showed the government that the industry is investing in promoting the benefits of good lighting, as well as making representations to them that policies should encourage investment in good quality lighting.

I have confidence that 2013 will prove to be a year of opportunities as well as challenges and I hope you share that optimism. I also believe that the strength of our industry, based on its image as innovative and high tech, will continue to attract well-qualified young people to join us. 

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Look what's in store

Robert Bain finds out how an all-LED solution is halving the lighting energy used at the Co-operative Food



The Co-operative is embarking on a programme to remodel many of its food stores to better target different types of customers. Different formats will be used in different locations, with the ambience and configuration of stores designed to appeal to local shoppers.

From the outset the Co-operative Food knew that lighting would play a big role in creating the right atmosphere in each store – and that LED lighting also provided an opportunity to reduce energy consumption and CO₂ emissions.

To refresh its look and feel, the Co-op has been working closely with Philips Lighting to come up with designs that complement the style and layout of each store.

The Co-operative Food's format manager Steve Gell said: 'Lighting is critical to any customer offer, especially when it comes to lighting key areas such

Different lighting designs are used in different types of stores

as fresh produce, in-store bakery and beers, wines and spirits. When the right lighting is used it further enhances product, making it look more appealing.

'The correct lighting also enhances a customer's experience and with all the other components we place into our stores it adds to the overall customer journey and experience.'

Retail specialists

The Co-op teamed up with a specialist retail team from Philips to come up with designs to suit the format of each shop. Key criteria included a desire to use an all-LED solution and to use the same product mix throughout all shops, to maintain consistency and continuity.

The chosen solution uses a mixture of Maxos LED luminaires and StyliD track-mounted spotlights. All of the luminaires are dimmable and linked to a Dali lighting management system. The Maxos



Co-op's Leyland branch is one of those that has gone all-LED



»» luminaires are installed in runs of trunking mounted on or suspended from ceilings to provide ambient lighting throughout the stores, and their design makes them easy to install.

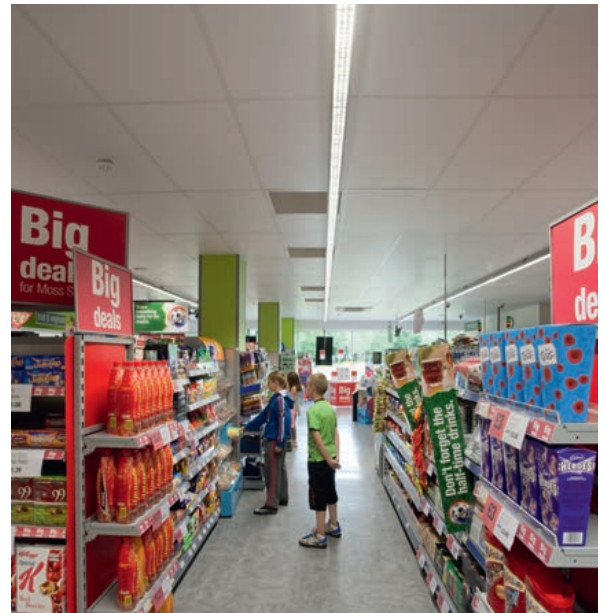
In key areas such as fresh produce, bakery and beers, wines and spirits, ambient light levels are supplemented by additional accent lighting from the StyliD fittings to ensure these higher value items are highlighted within the stores. Crucially, the new lighting designs increase vertical illuminance throughout each store compared to previous designs, so that the products are shown in their best light.

These LED systems are also futureproof, in that the LED boards can be easily replaced in the future as new LED technologies emerge.

'During the planning process Philips created technical lighting layouts on our CAD drawings, showing us the lux levels we would achieve,' said Gell. 'Following installation, they joined us on-site to make any amendments required, ensuring we were happy with the scheme and overall solution.'

As a result of the re-design, the look and feel of the sales floors in the stores has been greatly improved, with a cohesive lit environment that creates a better shopping experience for customers and shows the produce at its best. The scheme also provides energy savings of around 40 per cent. On top of that,

Spotlights supplement ambient lighting in key areas of the shop



dimming in response to daylight levels is expected to increase the total energy savings to around 50 per cent.

Gell said the early involvement of Philips on the project was a big advantage. 'They brought a number of solutions to the table, ensuring we were able to achieve and implement the right solution for our customer offer,' he said. 

Bright is beautiful...



GU10 7.1W - 355Lm

The new Toshiba E-CORE GU10 7.1W provides a low energy, long life solution to 50W GU10 halogen lamps.

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Squeezing out the savings

Juicy Couture's flagship store on Regent Street has a bold and bright new lighting scheme that's as efficient as it is exciting



Paul Nulty Lighting Design has come up with a bold and energy-efficient scheme for Juicy Couture's flagship store on London's Regent Street.

Nulty worked with Juicy's creative team and architect MRA to develop a scheme that captures the brand's flamboyant Hollywood style using a wide selection of light sources from a number of manufacturers.

Juicy Couture's lavish interior design bucks the trend for dark, high-contrast fashion shops, going instead for a look that's light and bright – but still efficient. The store has managed to squeeze a lot of light out of an operational load of 25W/m².

The Grade II-listed building gave the designers a few challenges, including limited ceiling recess depth. The number of ceiling-mounted spotlights

Fittings from a number of manufacturers were used in the store

was minimised and plaster-in fittings were used to blend with the building fabric. LED lighting is built into furniture and joinery, and light boxes on the underside of the ornate panels ensure merchandise is illuminated, and that spill light contributes to the soft ambience.

Bespoke design

The focal point of the ground floor is the bespoke chandelier fitted with LED candle lamps from Philips. This is encircled by a handmade plaster oval ring that accentuates the space and provides positions for adjustable spotlights and cold cathode uplighting for the ceiling.

Behind the cash desk, a taffeta curtain creates a theatrical backdrop for a neon Juicy Couture logo. LEDs add sparkle to accessories, displayed on

brass and mirror tables and shelves, and jewellery, exhibited in mirrored vitrines. At the back of the ground floor and on the mezzanine, the panelled wall detail is given a contemporary lift with integrated linear LED lighting. This ensures the lighting of vertical surfaces balances the daylight at the front of the store while maintaining a bright feel on the mezzanine, where the ceiling is low. LED lighting in the hanging rails, ensures merchandise remains centre stage.

Creating contrast

Fitting rooms combine edge-lit mirrors with high-level lighting provided by a plaster-in decorative feature. Lighting is soft and provides good facial modelling and colour rendering.

Key to the success of the Juicy Couture scheme is the way contrast has been created. By minimising the number of spotlights and instead using soft indirect lighting and spill light from the displays to illuminate the circulation areas, the scheme achieves a light and airy feel. Direct lighting has been restricted to the product displays, ensuring they are highlighted and 'jump out' while minimising energy use.

Long-life, low-energy luminaires mean less maintenance and better energy efficiency. The lighting control system reduces light levels at night, saving energy and reducing wear and tear on lamps. The total installed load is 35W/m², which falls to an operational load of about 25W/m². The project demonstrates that a bright retail environment can be created while minimising energy use.

Stephanie Srivastava, design director at MRA, said: 'The lighting combines with the architecture and interior design to create a store with all the modern glamour of an LA boutique and a sense of fun and elegance that sets it apart. Close collaboration between PNL D and MRA, and a client that was as enthused about the design possibilities as we were, ensured its success.' 🇬🇧

What it took

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INOX Fluorescent DimSlimLink; dimmable fluorescent batten
OSRAM Back LED 2
PHILIP PAYNE Tyke
PHILIPS Novallure LED candle
PROP STUDIOS Custom chandelier
SIMPLY MOULDINGS Custom plaster ring pendant (with contour interior and light snipe)



The shop's distinctive design stands out from its competitors



The scheme makes the most of the shop's alcoves



Cove lighting highlights Juicy's merchandise

Grist for the Mill

Neglecting your old light fittings will hold back your sales, while good lighting will shift goods from the shelves



Better lighting quality is helping to drive sales

Forty shops live under the roof of The Mill in Batley, West Yorkshire. They sell clothing, furniture, homeware and gifts. But in some places, stock just wasn't selling and prices had to be cut before it would shift – and the stores didn't know why.

The Mill wanted to reduce energy costs, increase lamp life, create a more pleasant environment and increase the visual appeal of displays – and do it all while keeping within a strict refurbishment budget. It tasked Gamma to supply a cost-effective low-energy alternative to the energy-guzzling 150W metal halide pendants it was using.

Time for a change

A survey of the site established that the pendant fittings could not deliver the light needed because they were old and inefficient. Not only that, many of the lamps were failing prematurely, leading to costs, low light levels and maintenance hassle. The survey also found that low-voltage downlights were being used as a visual lighting feature rather than to generate interest in product displays.



The DDG fitting uses two 42W CFLs




Adjustable spotlights provide display lighting

Planning pays

It turned out that stock was not budging from the shelves in some areas because of colour shifts and inconsistent lumen depreciation resulting from spot replacements rather than planned maintenance.

Gamma's DDG CFL pendants offered better light quality and colour rendering – partly because of the age and low light output ratio of the existing luminaires – while reducing energy use by 40 per cent and increasing lamp life. By changing from the 150W metal halide lamps to 2 x 42W CFLs, The Mill was saving 66W per fitting (not including driver consumption).

For the display lighting, Gamma supplied adjustable metal halide Topaz 115 G-Spot spotlights, installed around the low-voltage downlights to provide a discreet yet effective display light source. The Mill is now testing Gamma's Lingo LED track spotlights as well.

A pleasant shopping environment has been created and visitors are spending more time and more money as a result. And the stock that had to be reduced is now selling well. 

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LEDs are for life, not just for Christmas

Pets Corner has slashed energy by going LED, and is expecting its new lighting to last a long, long time




Pet supplies retailer Pets Corner is installing LED lighting in all its UK shops with the help of LED Eco Lights. The chain has more than 60 shops in garden centres, supermarkets and its own sites across the country, and is expanding rapidly.

All new stores will be fitted with LED lamps from LED Eco Lights' Goodlight range as part of Pets Corner's wider green objectives, which include buying all electricity from renewable sources and recycling three-quarters of its waste. Lighting in existing stores will also be upgraded to LED as part of an ongoing refurbishment programme.

The three most recently opened stores are at

Keston in Kent, Haywards Heath in West Sussex and Weybridge in Surrey.

Pets Corner's CEO Dean Richmond says: 'As a company, we are committed to an environmental policy based on sustainability, waste recycling and carbon reduction. Our decision to install 100 per cent Goodlight LED lighting throughout our chain of stores is a major part of that policy. We are already beginning to see major cost and maintenance savings so it's not only a sensible environmental decision but also a shrewd financial move.'

LED Eco Lights' LED tubes typically consume about 70 per cent less energy than a normal fluorescent tube and have a five-year guarantee. 

How it's done: retail lighting

How Projection Lighting's LED products have been used to solve a range of lighting challenges

in association with **Projection**TM
lighting



Brown's flower shop in Canary Wharf was recently refurbished with Projection Lighting's AlphaLED as a replacement for 50W dichroic halogen spots. Brown's needed improved light quality with first-rate colour rendering and low maintenance. Curve-track-mounted spotlights were installed throughout, with a CRI of 98. The low heat output was a bonus, extending the life of the flowers.

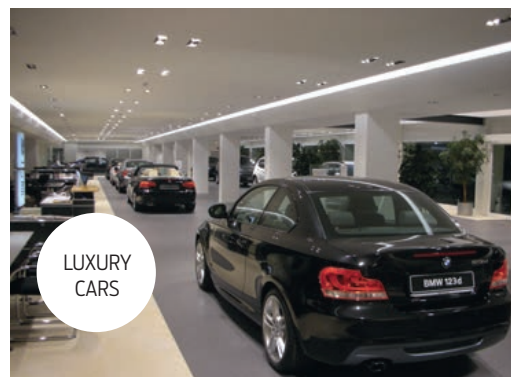
Divers bookshop in Lisbon, Portugal, recently upgraded its lighting to create a more vibrant, modern shopping environment. Projection's AlphaLED was incorporated throughout to meet the brief for efficient, high-performance illumination to enhance both the ambience of the shop and the detail of the books on display. Zero maintenance was an important factor in the choice of lighting to avoid expensive maintenance costs. Divers required a colour temperature of 3500K, chosen to help printed words stand out as customers are encouraged to read in the shop.



Requirements were precise for the new branch of designer clothing store **Miguel Vieira** in Johannesburg's Sandton City shopping centre. The look and feel of existing stores had to be replicated while reducing energy consumption to less than 34W/m², the level set by Sandton City owner, Liberty Properties. Projection's AlphaLED achieved 18.9 W/m², almost 50 per cent lower than asked and 84 per cent less than other Miguel Vieira stores. Projection believes this is the most efficiently lit store in South Africa.



Pizza Hut wanted to replace its AR111 low-voltage light sources. Projection Lighting supplied the AlphaLED GyroLed111 fitting – a variant designed specially to suit the application – for wall-washing and accent lighting over dining tables. This provided a maintenance-free solution with good colour rendering and consistency.



BMW's new showroom in Rome is entirely lit by Projection's AlphaLED Gyro Cube spot luminaires, replacing 75W halogen.

Designer Piero Comparotto says AlphaLED was the only solution that offered not only a five-year guarantee, but the required quantity and quality of light over that period. 'We could not compromise the brand's integrity with colour failure or lumen depreciation,' he said. 'Projection provided convincing data from independent testing on colour consistency and lumen maintenance.'



Asda required a low-energy replacement for the CDM-T spotlighting used nationwide in its fresh fruit and vegetable sections. Projection supplied the AlphaLED Curve fitting with the True Colour Elite CRI 98 module and 3000K colour temperature to provide superior quality of light and colour rendering without harming the produce. No colour shift is guaranteed over lifetime. This flexible lighting solution uses a daylight-linked dimming system compatible with building management systems. Further light fittings including bespoke designs were also used throughout the store.



FASHION

Following trials at six stores, highly detailed research and independent testing, **Next** proceeded with a major nationwide refit programme replacing tens of thousands of halogen MR16 and HQI lamps. Products had to meet exacting requirements, including a colour-rendering index of 80, a lifetime of 50,000 hours at L80, a maximum of five per cent failures and minimal colour shift throughout life. Projection's AlphaLED products enabled a quick payback for Next, while increasing illumination levels and maintaining great colour rendering.

Penalty, a sports shop in football-mad Madrid, needed a high-output replacement for 35W metal halide lights along with excellent colour rendering and energy savings. The 2000lm Metropole track-mounted adjustable spotlight fitted the bill with a designer look that suited the store. High-output AlphaLED spots with passive cooling ensured long term reliability, consistent colour rendition, low energy and reduced air conditioning costs. Three beam angles allow for uniform lighting that can be easily re-configured in line with seasonal displays.



SPORTS



BATHROOMS

Facq is a chain of bathroom showrooms in Belgium. Based on an Ikea-style lay-out and on a similarly large scale, it features complete bathroom settings that replicate the domestic environment. When Facq was updated, flexible lighting was required to serve several functions within just one fitting to blend with the homogenous interior. Good colour consistency was also a necessity. Projection's AlphaLED Universal Adjustable luminaire allowed for high-output general lighting, spotlighting and dimming to create contrasting moods in individual displays. A colour temperature of 3000K was chosen for a homely feel.

Jewellery shops require high-quality lighting with colour consistency and sparkle. A particular requirement for **Goldsmiths** was for high ambient lighting levels over the presentation desks where products are viewed in detail. In common with other retailers, high maintenance costs were an issue. Projection Lighting's AlphaLED products met all the criteria. Small fixtures with high lumen outputs were installed in single rows above each desk, providing optimum illumination and colour consistency.



JEWELLERY



FAST FOOD

Projection's AlphaLED luminaires have been specified for **Burger King** across the UK and Europe. The brief for the new Burger King in Ashford was for high-quality, energy-efficient lighting with low maintenance due to restricted access to high ceilings. With long trading hours, Projection's guaranteed quality of light for 50,000 hours was a major consideration. The scheme incorporated twenty five specially designed AlphaLED prismatic pendants, designed and made in record time and now specified throughout Burger King. Total energy savings of 1581W were achieved compared with traditional light sources with no maintenance – which would have been particularly costly given the high ceilings.



SHOES

When the exclusive Mayfair shoe boutique **Nicholas Kirkwood** was refitted, a complete new lighting scheme was installed using Projection's AlphaLED. The designer's priority was to reflect and emphasise the quality of the display and the high-spec interior with light levels of absolute uniformity. Any disparity in light levels would be apparent in the minimalist, white space that showcases the flamboyant shoe designs. Zero maintenance was a necessity, as was excellent colour rendering to highlight colours. Recessed AlphaLED downlights were chosen for general lighting, with discreet fittings to merge seamlessly with the interior. Accent lighting illuminates individual shoes, adding drama and decoration.

Under the spotlight

Lux looks at some of the best new products for retail lighting



Punchy adjustable spotlight

Concord's Lytelab is designed for use in areas with high ceilings and has an adjustable and lockable fresnel lens so the beam angle can be adjusted from 14 to 45 degrees. Lytelab consumes 45W and contains high-powered Sharp LEDs, which provide 800 lx at five metres. It comes with on-board Dali track dimming and has 50,000 hours of life at 70 per cent luminous flux. It comes with a five-year warranty.

www.concord-lighting.com



LED backlighting unit

Applelec's LED Light Sheet embeds high-brightness LEDs in an acrylic panel. The flat light source's slender profile is designed for easy installation. 3D V-cutting technology ensures the light is evenly distributed over the sheet: in essence, a clear acrylic panel is etched, and acts as a vehicle to carry an even LED light across the surface of the panel. LED Light Sheet is expected to last 70,000 hours and is suitable for use in display cases.

www.applelecsign.co.uk

Quick-install LED gimbal range

360+ is a family of 16 LED gimbals from ACDC with outputs of 1,000 and 2,000 lm. They're designed to have a similar output to 20 and 35W CMH and CDMT. Lenses are interchangeable for variable beams and the deep recessed LED and snoot positions ensure minimum glare. The range is sealed to IP20 and designed for quick installation – simply point and hold to focus.

www.acdclighting.co.uk/led/360+



Advanced display luminaires

There are six luminaires in Luxonic's Alterlite LED range, with light outputs from 1,000 to 4,500 lm. The range – designed for fashion and food display lighting – comprises spotlights, gimbals, a downlight and a trough system, all incorporating GE LED modules. Alterlite replaces CMH fittings and has a lumen maintenance of 85 per cent at 50,000 hours.

www.luxonic.co.uk



Dimmable semi-recessed spot

Philips' StyliD Mini is suitable for fashion retailers that want to maintain colour quality while cutting energy costs. The LED spot is available with several LED engine flux ratings, optical systems and accessories, and produces up to 700 lm. The 13W spotlight is compatible with ELV dimming and Dali, and is semi-recessed into a wall or ceiling. The expected life of the product is 50,000 hours at L70.

www.lighting.philips.co.uk



High colour quality luminaires

Projection's AlphaLED luminaires are a high-quality option for retailers, with a colour-rendering index of 98 and a depreciation of less than five per cent over 50,000 hours. The AlphaLED range incorporates the latest Xicato modules. Pictured is Metropole, the 2,000 lm high-output track-mounted spot. Projection secured major contracts for AlphaLED products with some of the UK's largest retailers in 2012.

www.projectionlighting.co.uk



Elegant new spotlight

Instead of the traditional baked bean tin shape, Illuma's Rotaspot looks more like a cake or a hockey puck, with the light fitting encased in a circular housing that incorporates cooling fins and a diaphragm to create airflow. *Lux* senses some influence from Apple in the Rotaspot's simple white exterior. To point it, you just turn the circle. The spotlight is designed to be used in the retail and display markets, and uses a Philips Fortimo module to produce a 2,000 or 3,000 lm beam.

www.illumina.co.uk

LED halogen replacements

Verbatim has introduced a range of LED lamps to replace halogen in retail applications. The spotlights provide colour rendering of up to 95 and a white spectrum from 2700 to 4000K. The PAR16 GU10 lamps can replace 35 and 50W halogen lamps, while a short-neck 14.5W PAR30 E27 lamp replaces a 75W halogen. The AR111 LED lamp has a short-form factor to aid retrofit use.

www.verbatim-europe.co.uk



Projector with a powerful punch

Reggiani's Yori is a small, adjustable projector. Two simple elements are linked by a discreet joint that lets users adjust the beam. Ideal for retail displays, it's been designed for use on track or mounting rails. It can accommodate both LED and metal halide light sources. When used with LEDs, Yori's output is up to 2,535 lm and has an efficacy of 97 lm/W and a colour-rendering index of up to 94.

www.reggiani.net/en

Metal halide lamps for retail

Osram's Powerball HCL metal halide lamps are designed for use in closed luminaires where light quality is vital. The high-quality manufacturing process guarantees reliability and a long life. Ceramic technology combined with a round burner offers efficiency of up to 107 lm/W a CRI of 90. The HCL Spotlight, which optimises rendering of red tones, is also available.

www.osram.com



GE's adjustable LED downlight

GE's Infusion downlights are designed for applications where quality of light is critical to the customer experience. As well as offering excellent energy efficiency and long life, Infusion downlights allow the LED module to be upgraded, so users always have the most efficient product. Versions are available with lumen packages of 900-3,000, with Dali or 1-10V dimming.

www.gelighting.com

Optimised for Dali control

The Marathon LED Dali track spotlight from Fagerhult can, when used with Fagerhult's iTrack system, deliver the energy and maintenance benefits expected from LED light sources along with a flexible way to control each light fitting. The spot is optimised for Dali control, and the light levels can be defined and changed either by movement, daylight levels, specific commercial scenes or the time of day. The flexibility of the system ensures the lighting can evolve with the merchandise on display, creating atmospheric shopping environments.

www.fagerhult.co.uk

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GE
Lighting

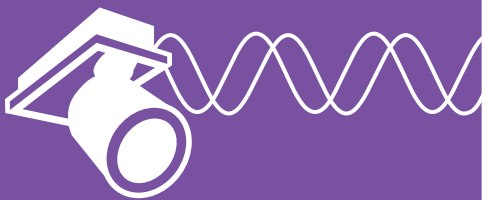


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-  **Minimise energy**
-  **Create spaces that boost sales**



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Viewpoint

Lorraine Calcott, director, It Does Lighting

Lacklustre lighting is bad for business

It's time to stand up for the value of design in retail lighting

As a woman who enjoys her retail therapy, I am increasingly bemused by the dire lighting that confronts me on my forays into shopping centres around the UK.

With the technical advances we have seen and the talented designers out there, I am at a loss as to why the lighting is so poor. Insufficient budget? Lack of creativity? Corporate image hampering innovation?

Probably the real issue is *when* the designers are brought on to a project – usually too late to have a real influence. Instead they find themselves battling with an architect's or interior designer's view of what they want the space to look like rather than working out how customer-friendly the lighting will be.

For me, changing rooms are horrific places with badly-designed lighting that makes us cringe at our reflection and hinders potential sales. But there are a multitude of other avoidable atrocities lurking around every corner – the make-up sections in department stores where you have to leave the store to see if red is indeed red or if the lipstick is some other hideous shade. Fashion departments where telling black from navy requires superhuman powers. Bookshops so badly lit you can barely make out the titles. Hollister is possibly the worst high-street offender for making its stores so dark that only those with night-vision goggles stand a chance.

Why have things become so crazy? After all, we have fantastic light sources to use and more scope than ever to make spaces fit for purpose.

I believe we should push the boundaries. Make retail spaces that work on a human level and not just a commercial one. Tell our clients not what they want to hear but what they need to hear, because in the end they and their customers will love us for it.

Get the colour temperature right for the space and the function. Use lamps and light sources with the right colour rendering – there is no excuse for getting this wrong. Think about the effect the lighting has at a subconscious level and how it will help achieve the end results our customers want – don't skimp on good lighting to save money because you will regret it. Do it right or not at all. Lighting can make

or break a store: it's part of your client's brand and can boost staff satisfaction and customer retention.

So look up when shopping, see how you feel in a space. Consider what effect you want. Can you use light to move people through the store or to generate revenue? What do you want to hide?

Shopping should be fun. You want to come home with purchases that look the same as they did in the shop. You want to match items and to know if a colour is going to be good for your skin or make you look washed out. You want to be a happy shopper.


Alongside fashion, banks, food stores, eateries and technology shops all have issues of their own. Let's face it, they love a downlighter, but it makes their ceilings look cave-like and dark. Food stores trick us with lighting that makes meat look redder and veg look fresher but does it make us buy more? Endless banks of fluorescent recessed luminaires are functional but add no interest or beauty to enhance the customer experience. Do we really warrant such

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'We should push the boundaries and make retail spaces that work on a human level, not just a commercial one'

little consideration as humans that the places we go are not tailored for our needs and comfort but only for commercial gain?


It's about time lighting got the recognition it deserves and its designers took their place at the start of a project and not as an afterthought. We must defend our specifications and not let contractors change them at installation. Why pay for the considerable skill of a competent lighting designer if you are only going to downgrade the luminaires based on price and not performance? It's like saying that your mum giving you a haircut is the same as going to a proper hairdresser.

Let's start a retail revolution and come out from the shadows. Let's make 2013 inspirationally and beautifully lit. 

Heirs to the halogen throne

A new generation of LED products is battling to replace halogen reflector lamps. Alan Tulla reviews 10 retrofits for mains voltage GU10 and 12V halogen

GU10 and 12V halogen reflector lamps are everywhere these days, guzzling up energy and waiting to be phased out. In recent years LED replacements have come on in leaps and bounds, and many are now a match for their older cousins in performance, as well as offering whopping energy savings. There's a wide range of options out there, and this month we looked at 10 of the latest GU10s and 12V MR16s to see if they live up to their manufacturers' claims.

Remember, these are just a selection – lots of others are available – and all prices are approximate. The 12V track we used for testing was kindly loaned to us by Optelma Lighting. The mains voltage GU10 track was bought from a high street DIY outlet. 



Comparing LED GU10s with a filament lamp (on the right)



Aura Ultimate T8 tube

In last month's Lux Recommends we stated that the service life of Aura's Ultimate T8 tube was 70,000 hours. The correct figure is 80,000 hours. This is based on a 12-hour switching cycle (the same life-test regime used for the other long-life fluorescent lamp we reviewed), and makes Aura's product the longest-lasting of all those we looked at. The frequency of switching and the type of control gear used will, of course, have a major impact on the life of the lamp.

Retrofit checklist



For a retrofit lamp to match the design and shape of the halogen it replaces, compromises have to be made. Try before you buy, and keep these points in mind.

What are you replacing? A 6 or 7W LED unit can be a good replacement for a 35W tungsten MR16. But be wary of claims that products are 'equivalent to 50W'. All the LED units we looked at gave light output much closer to a 35W, even if the peak intensity is sometimes higher with LED.

How does it look when off? When switched off, the LED units look very different from a standard MR16 or GU10. Most have a ring of aluminium fins around the perimeter of the lens and all have the giveaway phosphor spot.

How much light will you get? Unless you're replacing 20W halogen, we recommend you use LEDs of 5W and above. Always try retrofit lamps alongside the original. Remember retrofit lamps can improve appearance – the ones we tested tended to have slightly more uniform beams and softer edges than the halogens.

How long will it last? The stated life of these units varied from 25,000 to 50,000 hours, but check the failure rate and number of switch cycles that this figure is based on.

What colour appearance do you want?

The colour appearance of the beam differs from one brand and wattage to another. If you want consistent appearance, use one type of lamp.

How will it render colours? LEDs have a lower CRI than tungsten lamps. All the ones here state 80 or above – quite acceptable for day-to-day use.

How much is it? Prices for an LED GU10 range from £12 to £20. Be sure to compare like with like – these lamps vary a lot in performance.

Soraa Vivid MR16



BEST
COLOUR
RENDERING

POWER 12W
LIGHT OUTPUT 340 lm
EFFICACY 28 lm/W

CRI 95
CAP GU5.3
PRICE £29

The Soraa Vivid LED stands out for the quality of its colour rendering. Its super-high CRI of 95 is achieved by using a violet LED rather than the usual blue, and a substrate of gallium nitride. It's ideal in places where the quality of light is paramount, such as high-end retail, museums and art galleries. A lot of thought has clearly gone into its sleek, unconventional appearance, with a mesh-like heatsink that's almost not there when you look at it from the front. But the Soraa lamp won't be for everyone: it's pricey and significantly less efficient than its competitors.



Verbatim 7W MR16



BEST
OUTPUT

POWER 7W
LIGHT OUTPUT 500 lm
EFFICACY 71 lm/W

CRI 80
CAP GU5.3
PRICE £18

Verbatim is no newcomer to electronics – the company is part of Mitsubishi Chemical and you might know the name from memory cards and blank CDs. The company says its 7W lamp has the highest efficacy on the market at 71 lm/W – it's certainly the most efficient one we came across. It also comes in a 24-degree narrow-beam version so at 500lm it packs a massive 2,500cd punch – the highest we've seen. A great piece of kit.



Verbatim 6.5W MR16



POWER 6.5W
LIGHT OUTPUT 270 lm
EFFICACY 41 lm/W

CRI 80
CAP GU5.3
POWER £15

The 6.5W Verbatim model has a warmer colour temperature, lower light output and longer life than its 7W cousin. But it doesn't give quite as much light output bang for its power consumption buck, coming in at 41 lm/W. The design of the two is significantly different – this one uses just one LED and has a different heatsink.



Sylvania Hi-Spot RefLED GU10



POWER 7W
LIGHT OUTPUT 450 lm
EFFICACY 64 lm/W

CRI 80
CAP GU10
PRICE £18

These guys invented the GU10 halogen back in the 1990s, so they should know what they're doing. In June last year, *Lux* picked out an earlier version of this lamp as one to match, and this new version squeezes even more lumens out of fewer watts, beating almost all the competition for output and intensity. It also has a clean beam and crisp 3000K appearance. Don't buy anything without looking at this one. A dimmable 350lm version is also available.



Megaman GU10



**BEST
VALUE FOR
MONEY**

POWER 6W
LIGHT OUTPUT 410 lm
EFFICACY 68 lm/W

CRI 80
CAP GU10
PRICE £12

Megaman makes some of the highest output and most efficient lamps on the market. They are also known for being good value. Megaman's 6W, 500cd unit performs particularly well, squeezing out an impressive 410lm, and at £12 it's fantastic value. A neat feature is the diamond-pattern front lens that hides the LED chip from view and makes this retrofit more similar in appearance to its filament equivalent.

VERDICT ★★★★★

Philips Master LEDspot GU10



POWER 6W
LIGHT OUTPUT 320 lm
EFFICACY 53 lm/W

CRI >80
CAP GU10
PRICE £22

This Philips lamp and the Toshiba (below) are the two smallest ones we looked at. Philips are marketing this unit as 'perfect fit' – it's more likely than most to fit in retrofit applications. Life is stated as 40,000 hours. On the other hand it's not the most efficient and is relatively expensive at £22. We were also slightly irked by the claim of '50W halogen replacement' write large on the box. With an output of 320lm, it's not what we'd call a 50W replacement.

VERDICT ★★★★★

Flux Spot GU10



POWER 8W
LIGHT OUTPUT 400 lm
EFFICACY 50 lm/W

CRI 85
CAP GU10
PRICE £23 (2 yrs credit available)

The 8W Flux lamp produces 400lm, giving you more light than most. But the size and dustbin-like appearance are a let-down, and at about £23 it's overpriced (in spite of Flux's two years' interest-free credit offer). The unit is about 2cm longer than the rest, so you'll need to check it fits your fitting. Its clear front glass with a faceted reflector is similar to a filament MR16. This is countered by a support bar across the front, although this didn't seem to disrupt the beam of the 8W version.

VERDICT ★★★

Toshiba E-Core GU10



POWER 7.1W
LIGHT OUTPUT 370 lm
EFFICACY 52 lm/W

CRI 80
CAP GU10
PRICE £21

This 'true fit' unit is impressively small, performs well and, as with many of Toshiba's products, the unlit appearance is much cleaner than the competition. Although the stated CRI of 80 is no higher than the others, many clients choose this unit for the quality of light. They're available in 2700 and 4000K versions, the latter of which hits 370lm at 52lm/W. Life for both is stated as 40,000 hours.

VERDICT ★★★★★

Osram Parathom GU10



POWER 7W
LIGHT OUTPUT 350 lm
EFFICACY 50 lm/W

CRI 80
CAP GU10
PRICE £14

The 7W Osram unit has the highest peak intensity of all the GU10 retrofits we tested. It's an attractive-looking unit and seems well constructed. The packaging says it's equivalent to 50W – presumably based on the high peak intensity rather than the 350lm output. One slight niggle is that the units we tested had a slight mauve tinge to the beam. But on the whole it's a good performer at a very reasonable price, and it comes backed by a four-year guarantee.

 **VERDICT** ★★★★★

GE Energy Smart GU10



POWER 6W
LIGHT OUTPUT 360 lm
EFFICACY 60 lm/W

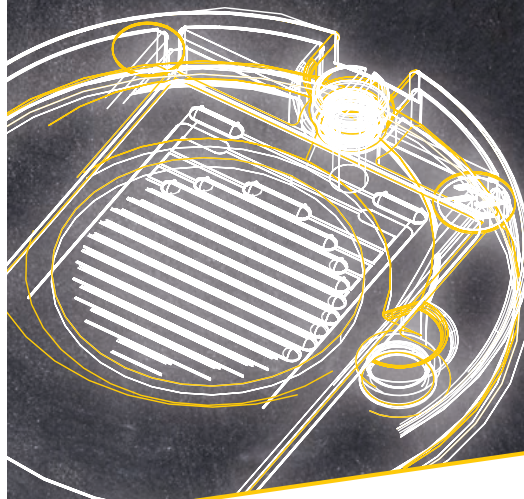
CRI >80
CAP GU10
PRICE £17.50

The 6W GE lamp is a solid all-rounder. It produces a highly respectable 1,250cd for the 25-degree beam (780cd for the 35-degree) and is available in colour temperatures of 2700, 3000 and 4000K. At 60lm/W it is one of the more efficient performers, and it's one of the better-looking ones too. Not at all bad for £17.50.

 **VERDICT** ★★★★★

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www.vossloh-schwabe.com

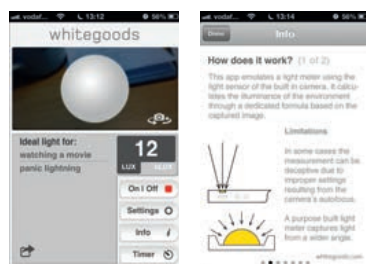
A member of the Panasonic group **Panasonic**

Pursuit of app-iness

As the world of lighting goes digital, some players are trying their hands at apps for smartphones and tablets. **Pennie Varvarides** checks out what's on offer

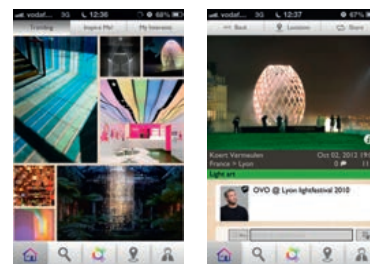
LightMeter

This app by Whitegoods uses your mobile phone's camera to take lux readings. It's only as good at measuring light as your phone, which in our experience (with an iPhone 4S) was not that great. We calibrated the app using a venerable Hagner lux meter and found that we had to turn the sensitivity right down for the readings to be anywhere near what the Hagner told us. In office conditions its readings were at least 15 per cent higher, but the camera's limited field means results vary greatly depending on where you point it. In a daylight stairwell, simply tilting the camera towards and away from a shadowy wall made the reading jump between 50 and 1,000 lx, while the Hagner settled somewhere in between. We suggest users heed Whitegoods' disclaimer that this is not a replacement for a purpose-built meter.



LightCollector

LightCollective and Philips have created this nice little app for sharing photos of light – a bit like Flickr or Instagram for lighting enthusiasts. You can browse pictures uploaded by others, and after signing up (for free) you can also 'like' and comment on pictures, follow users, and upload your own photos. The trend feature lets you see what's hot, and the search functions let you explore the crowdsourced collection. You can even search on a map and see photos taken nearby. LightCollector can also be accessed on the web using a computer or iPad, which we found an easier way to browse than using the mobile app. The true test will be if it can maintain an active community of users, but LightCollector certainly has the potential to be a fun and useful resource.



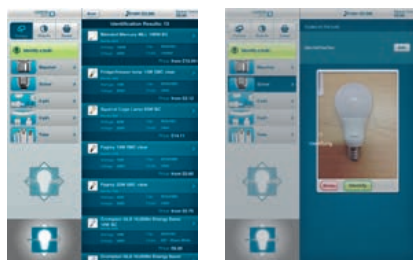
COMPATIBILITY iPhone
PRICE Free
SCORE ★★



COMPATIBILITY iPhone, Android
PRICE Free
SCORE ★★★★★

Bulb Finder

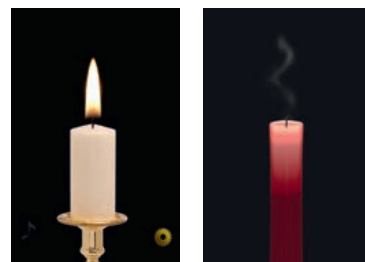
According to its developer, lightbulbs-direct.com, this app is 'the world's first photo-recognition light bulb finder', promising to identify any lamp you can get your hands on. Simply snap a pic of the lamp, and Bulb Finder gives you all the technical data and an option to order one. Trouble is, it doesn't work – at least not for us. We tried lots of different lamps, and in all cases Bulb Finder either couldn't find a match or all its matches were way off – even when we specified the base type and entered the codes printed on the product. We ended up using the 'Send to expert' feature, and to their credit the Bulb Finder team got back to us quickly with a link to the correct product. But by that time we might have well have just Googled it. This app is a cool idea, but it needs work.



Candle Free

This silly little app does exactly what it says on the tin, which isn't a great deal: it displays a candle on your phone's screen, and it's free. The developer says it is 'the most photorealistic candle ever made for the iPhone or iPad' – an assertion we haven't been able to disprove.

Candle Free was good for about five minutes of entertainment in the *Lux* office – perhaps a little more when you start showing people how you can make the candle flicker or even blow it out by blowing into the microphone. But if, as the developers of the app suggest, you're planning to use it to 'set the mood' in a hotel room, then you may find yourself disappointed. It does have the advantage that it would be very difficult to burn your house down with, but on the whole we'd suggest you invest in a real candle.



COMPATIBILITY iPad, iPhone
PRICE Free
SCORE ★



COMPATIBILITY iPhone, iPad
PRICE Free
SCORE ★★

freedom in lighting

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to the system



to the user interface





Reality check

Gordon Routledge, lighting expert and publisher of Lux Review

Lux questions some oft-repeated claims about lighting and looks for the truth. This month...

'This LED lamp has a life of 50,000 hours'

The world's longest-burning bulb lives at a fire station in Livermore, California. It has been going almost continuously for over 110 years. Its reward for seeing all this action is a Guinness World Record, its own website (complete with webcam so you can see for yourself) and a continuous stream of lighting aficionados making pilgrimages to celebrate yet another year. Tales of conspiracy are rife in Livermore: surely this proves that we've all been robbed for the past century by lighting companies deliberately making lamps fail to make a fast buck.

So how has this freak of the lighting world managed to see itself through two world wars and countless economic disasters? The truth probably lies in its power supply. It is never switched off, and its 60W of power is dimmed to a mere four. Switching kills many types of lamp – that's why they always fail just as you turn them on. The stress of the start-up is what causes the damage.

It's also well known that dimming extends the life of most types of lamp. If we extrapolate the Livermore example to a 75,000-hour rated fluorescent tube dimmed to five per cent, it could last for thousands of years. LEDs can be switched millions of times without failing, so a dimmed LED switched on for an hour a day could last for tens of thousands of years, only to be extinguished by the shifting of continents. So why can't we have these super long-life devices?

Fifty-thousand hours is a figure seen often on LED data sheets and in lighting manufacturers' catalogues. That's nearly six years. Now we are starting to see manufacturers giving 10-year warranties – up to about 90,000 operating hours, in theory. At the other end of the scale some LED replacement lamps are rated at just 10,000 hours. So why the difference? After all, many of these products are using the same chips.

The answer is it's all down to a complex trade-off – you could probably produce a 100-year rated LED bulb, but it might not be very bright and no-one would stump up the cash to buy it. In any application the trade-off between achieving the right amount and

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quality of light, combined with space and thermal factors, determines the cost of the product and its life.

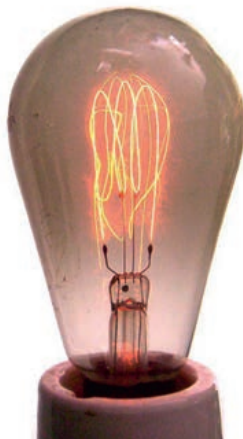
A streetlight must last for a considerable amount of time, because the capital cost and effort required to install it are significant. LED bulbs are easier to replace, and they're constantly getting cheaper and better anyway. So do we need expensive 50,000-hour lamps today? Wouldn't we be better off with a 10,000-hour lamp for a fraction of the price?

Take an example. If you put a 50,000-hour LED bulb in a bathroom which is used for a total of an hour a day, but switched off and on around 10 times a day, the 50,000-hour lamp would last for 57 years. Even if you haven't moved house or shuffled off this mortal coil by then, I'm sure the room it's in will have been refurbished once or twice. A 10,000-hour product would do a perfectly respectable 11 years.

LEDs don't mind being switched, but the drive electronics do, and more and more LED bulbs state the number of switching cycles they're expected to withstand on the packaging, which can range from 10,000 to 100,000.


Take another look at the bathroom application with 10 switching cycles a day – a unit rated at 10,000 cycles will only last around three years, while one with 100,000 cycles will last 30. The 'life', as it turns out, has very little to do with how long the product will actually last.

A carbon filament bulb not unlike the one that still burns at Livermore, and a modern LED bulb from Philips



We need to be clear.

Do we need over-engineered LED bulbs likely never to have the opportunity to fail because the building around them has been changed first?

Or should we be asking manufacturers to state a reasonable life, and make sure the lamp can be switched on and off enough times during that period? 

Filament bulb image: Ulf Seifert

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McIntyre says it's difficult to keep up with developments in energy-efficient lighting technology

Keith McIntyre

Energy and environment manager, King's College London

Lighting is a big area for energy savings

My job is to keep an eye on energy and environmental issues and look at potential energy-saving programmes. Lighting is one of our major areas. In the next five years we will probably spend close to £3 million on upgrading our lighting systems. We really want to be 100 per cent LED. We know we can lower the amount of energy we use without bringing in inferior light.

Every project is different

Every project is looked at separately. There isn't a 'one size fits all' lighting scheme. We're looking for products we can control and for the right colour rendering. It's amazing how some people prefer to have daylight colouring, and others will quite happily go with a standard warm. With LEDs we've found we don't get the shadow we usually get, and

'It used to be difficult to convince the finance guys to invest, but not any more'

we definitely don't get the flickering – always a complaint on our fluorescent lighting. We've done lots of trials. People definitely prefer cool whites in offices and when working with computers; they seem to get fewer headaches. Whether that's real or perceived we don't know, but it works.

LEDs have come of age

We've probably done more lighting projects in the Maughan Library than in any other building – each different. We changed from halogens to compact fluorescents, and many of the lights have now changed to LEDs. The Maughan has probably been one of our biggest successes in lowering our carbon footprint per square metre, and it's all been down to lighting. In the past two and a half years, we've probably lowered our carbon footprint there by about a quarter. Some of it's been control, but a lot of it's been moving to LEDs. Products are coming on the market now that meet our requirements.

New solutions are appearing all the time

Every time you turn around a new light comes out. Someone comes out with a product and you

think: 'That's an area where I've been trying to get something done for ages and that's exactly what we're looking for.' That's what happened with the Steinel light. We had internal corridors inside halls of residence with 36W 2Ds that were on all the time – then suddenly we had a light that also had an emergency fitting, had a background light and had passive presence detectors all built-in, which actually fitted that area. It was perfect.


Products are obsolete almost as soon as you buy them

We try to keep on top of lighting developments, but it's difficult. The trouble with lighting is – almost like the old computer systems – you buy a computer, take it outside the shop and already it's obsolete. Two and a half years ago, when we specified the Steinel products, they were what we needed, but things have changed so much since then. We've got a payback on them of about three years and expect them to last eight, but when new products come along with energy savings greater than the capital investment, then we will probably make the investment. We save money and we save carbon.

The CRC Energy Efficiency Scheme is a big factor for us

It used to be difficult to convince the finance guys to invest, but not any more. I think the carbon question has probably been the biggest push, because not only will we save money on energy, but we're also lowering our CRC payments. We have a massive CRC bill, £600,000. So any inroad we can make into that is a significant saving.

Who knows where it will end?

I remember cold cathodes coming on to the market and that was a major breakthrough, these wonderful lights that took about 8-9W. So we replaced our GU10s and took out our dichroics, and then, lo and behold, compact fluorescents come along. So the cold cathodes went. The next thing you know the LED comes along and replaces the compact fluorescent. I've no idea where it will finish, but every single one of those is giving better light output at a lower energy rating. We will always be looking at the energy rating and making sure that we don't actually see a deterioration of the output. 

✉ YOUR LETTERS

Lighting and crime

I read with interest Gordon Routledge's 'Reality check' column on streetlighting and crime in the January issue. We hear a lot about lighting and crime and unfortunately much is based on speculation and opinion rather than evidence.

In 2002 two key Home Office research studies – *Effects of improved street lighting on crime: a systematic review* and *Crime prevention effects of closed circuit television: a systematic review* – were published. These established that good lighting reduces crime and that CCTV is only effective with good lighting.

The main benefit of good streetlighting in relation to crime seems to be in reducing people's fear of crime and encouraging them to use the streets at night.

Last year I was lucky enough to attend an All-Party Parliamentary Lighting Group meeting on streetlight switch-offs. Crime and the perception of crime is high on the agendas of politicians, but little evidence could be supplied to support some local authority claims on the topic. The only fully investigated and researched study was from Dr Kate Painter of the University of Cambridge's Institute of Criminology, whose team undertook a detailed before-and-after investigation of the relighting of Cornwall, showing a reduction in crime including burglary.

When looking at such issues, I suggest that a publication such as *Lux* include reports from suitably qualified experts such as Painter.

HOT LETTER



The author of the Hot Letter receives a jar of the awesome Chilli Jam from the Chilli Jam Man (Twitter @thechillijamman, Facebook: The Chilli Jam Man).

Allan Howard wins the Hot Letter this month.

📷 YOUR PICS



Taken on Blackheath, south east London using a Canon G13 by Fadhil Habib. 'This was one of those really grey gloomy days over Christmas,' says Habib, 'and I was stuck by this solitary figure braving the elements.'

I would also suggest that the lighting industry lobby the Home Office to review and update the two reports mentioned above.

Allan Howard

Past president, Institution of Lighting Professionals

Urban mythology

When I saw your article on the urban myth of streetlighting and crime (January 2013) I thought I'd stumbled on an article from the *News of the (Lighting) World*, such was the sensationalist approach.

It was disappointing that the writer produced an article that would convince many readers that lighting was an unnecessary expense and that all the functions of urban lighting could be carried out by getting a dog.

The writer tells us that the police haven't found any increase in crime due to switch-offs. But many of the statistics cover only

one year, because many local authorities have only recently employed a part-night or a total switch-off regime. Most accident statistics are recorded over at least a three-year period, and often much longer.


To illustrate the danger of darkened streets, some months ago we were informed by Essex Police that a motorist travelling in a darkened street where the driver is reliant on his headlights, would need to be travelling at a maximum of 17 miles an hour to be able to stop in time to avoid hitting something or someone.

This article trivialised the benefits of streetlighting. *Lux* would serve the lighting profession better by lobbying to prevent the deterioration and destruction of the lighting service.

Stuart Bulmer

Professional services manager, Institution of Lighting Professionals

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Blast from the past

As a relative veteran (32 years and counting) of the electronics business, LuxLive 2012 was a real eye-opener for me. First, it demonstrated just how quickly the LED lighting market has grown in recent years, and second, I discovered where much of the young electronics talent has migrated to. Finally, it was great to witness a vibrant and pulsating environment at an electronics show in the UK.

LuxLive was reminiscent of my early days in the electronics industry: new ideas and products, market expansion and talk of perpetual growth. In short, a great business to be in. I hope that investors, entrepreneurs and indeed the government seize this opportunity to re-energise the technology sector and attract graduates, trainees, apprentices and 'career changers' back to the electronics industry.

The LED lighting market will continue to expand at double-digit rates for the next five to seven years and other synergistic markets will spawn directly from this growth, creating a huge pool of opportunity as they do.

Nigel Watts

Axcelled

Safety first

Having read your article on Philips recalling its top-of-the-range MasterLED GU10 lamp after reports that the lamp body could become live, I believe that all lamps having exposed metal parts that are touchable need careful consideration.

This highlights the need for effective earthing of the metal

parts of the luminaire and that the exposed metal part of these lamps needs a good contact with the lighting circuit CPC. Electricians and householders must know how to inspect lamps and luminaires and be aware of the necessity of effective earthing practices on luminaires that have exposed metal parts.

If the faulty Philips GU10 LED lamp was installed into a luminaire with exposed metal parts which was 'effectively earthed', then the CPC would enable the flow of fault current to trip or open the circuit protective device.

Ian Edge

Electrical engineer, Network Rail

Buyer beware

Having read your article on dangerous LED tubes, it's easy to see that consumers are concerned about problems with LED products – just Google it.

LED lighting products should be certified and tested prior to release, but this is often forgotten. Many products on the market have false certification or none at all, mainly brought in from Asia.

Furthermore, similar products are sold to EU countries by resellers who have limited understanding of the technology. Most of these will have a CE mark, so why do they cause interference with radio and TV signals?

Although today's LEDs are capable of high performance and long life, consumers are likely to prefer cheap LED lighting, which will cause issues with interference, overheating and high failure rates. Check before you buy LED.

Bart Gesner

Technical director, ArmadilloLED

YOUR TWEETS



Have something to say on the lighting revolution? These guys have! Last month's **#TweepCrown** went to **@GemmaLighting**, who chose this month's question: What will be the most significant change in the lighting industry in 2013?



@ianfursie

Lots of LEDs from 2010/2011 will start failing early and the proverbial will hit the fan at full pelt #TweepCrown



@ianfursie

If LEDs can hit 200lm/W in the future why would anyone want to buy an LED in 2013?



@LMKPartnership

@ianfursie Everything will be better in the future. If we didn't buy into the new tech at some point we'd be sat round fires



@lithoniaLED

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Lighting is being designed for people!



@Lux_magazine

Interesting. Is people-focused lighting design this yr's top trend? RT @VibiaLight: Lighting is being designed for people! @Lux_magazine



@jothebulb

@Lux_magazine if it is, doesn't that imply we've been getting it wrong up until now?



@thomaswensma

All this talk and tweets about what will be the lighting trends for 2013....sorry but that is NOT important! Focus on great design instead!



WINNER

@SednaLED

@Lux_magazine In the current economic climate, the most important factor will be the cost effectiveness of lighting #TweepCrown

@SednaLED will have the honour of picking next month's #TweepCrown question. Follow @Lux_magazine and #TweepCrown to join in



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Viewpoint

Ray Molony, publisher, Lux magazine

Great expectations

Trying to solve LED dimming problems is the latest pastime in the lighting business

'Hi there, I think I've got a faulty batch of your new LED lamps.'

'What exactly is the problem, sir?'

'Well they're all flashing when we try to dim them.'

'No the lamps are fine – there's something wrong with your dimmer.'

'Really? On the side of the box the lamps came in, it says "dimmable"...'

'And they are.'

'So why are they flashing then?'

'The fault is with your dimmer. Our lamps are too efficient for it.'

'Listen pal, this dimmer is top of the range and cost the best part of grand. There's absolutely nothing wrong with it.'

'I never said there was. It's just that it's not seeing enough of a load. Our lamps are 8W each but the dimmer is much happier with 100W each. It also sees incandescent tungsten differently from the electronic driver that's hidden inside one of our lamps. You've confused the dimmer.'

'Not as much as you've confused me. How do I solve this?'

'You'll need to include a dummy load in the circuit. That'll make the dimmer happy because it's a resistive load that the dimmer likes. Your lamps should dim fine after that.'

'But doesn't that defeat the purpose of installing low-energy lamps?'

'Look, your client is getting the latest cutting-edge LED lamps and they'll dim nicely. Surely he'll be happy with that?'

Sound familiar? Conversations like this – trying to solve LED dimming problems – have become the latest pastime in the lighting business.

The truth is, the lighting industry has created another monster that's confusing the hell out of everyone.

The fact is it took us decades to solve the problem of dimming fluorescent. We never quite sorted out dimming compact fluorescent and then we lost interest. And now it looks like it'll take us a while to

get to grips with doing the same with LEDs.

Many blame lamp manufacturers for not including the extra, clever circuitry that tells a lamp when it has reached its dimming threshold and dimmer manufacturers for not including the clever circuitry that let's the dimmer recognise when it's looking a low load (and not no load at all).

I have sympathy for the manufacturers however. They are under pressure to build products to a price – especially LED products, which already have a serious price barrier built in. It must be nigh on impossible to design a lamp or luminaire that is compatible on every single dimmer in existence. So

'The truth is, the lighting industry has created another monster that's confusing the hell out of everyone'

some incompatibility is inevitable. As Scotty used to say in *Star Trek*: 'Ye cannae change the laws of physics.'

Part of the problem too is expectation. Everyone's become used to smooth dimming on incandescents and they are upset when this doesn't work with the nice A-shape lamps we have created to look exactly like the lamps they are replacing.

For instance, we on *Lux* magazine know of no-one on the planet who can dim a 4W lamp down to 1 per cent of output, but that – rightly or wrongly – is the expectation of clients and contractors.

The answer, as usual, is a big education job. To re-educate the world not to expect the world of LEDs to be exactly like the old world.

We'll get there in the end I'm sure – but in the meantime expect lots of conversations like the one at the start of this column.

Happy dimming! 

● **What's your experience of LED dimming? Join the conversation at our LinkedIn discussion group, Lighting Talk: www.linkedin.com/groups/lighting-talk**

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Control freak

Sam Woodward, controls expert

In praise of pilfering

The lighting industry has been appropriating controls technologies from other sectors at a quickening pace – what can it give back?

In the forests of Australia and New Guinea lives the bowerbird, an intriguing and resourceful creature that collects interesting things to decorate its domicile and help it achieve its objectives – chief among which is to attract a mate.

The world of lighting controls, similarly, has been busy successfully picking up shiny and useful technologies from the industries that surround our own (and some further afield), and using them for our own purposes. This flagrant plagiarism is to be encouraged, because it lets us to offer a richer and more fully-featured inventory of controls options.

The backroom pioneers of the commercial and architectural lighting controls industry have been busy making sure that there is no needless reinvention of the wheel – there is an abundance of useful technologies out there that we can borrow.

Take colour-changing LEDs as an example. With dynamic colour-changing appearing on the specs of commercial and architectural building projects, our industry has turned to the entertainment industry for control technology, in the form of the DMX protocol. DMX is simply a way to encode and transmit a large number of channel levels from a controller and send them down a single cable to a number of devices.

In the theatre and rock 'n' roll world, DMX is not about colour selection specifically, but it's a short hop from using a collection of rapidly broadcast channel levels to represent brightness on a group of theatre lanterns, to using them to represent the red, green and blue (or perhaps amber and white) levels in a colour-changing luminaire.

But we must encourage our installation engineers to become as fluent in the requirements of DMX wiring as they are in mains wiring installation.

We've also borrowed in the realm of networking. When it comes to local networks, there are a variety of common systems that have their roots elsewhere. Many are based on RS485 (developed in the IT world in the 1970s) or CAN-bus, which started life as a communication method for engine data in cars.

In all control protocols we must consider the data and the way it is transmitted as independent

The bowerbird –
a consummate
borrower




elements. With these protocols, although the meaning of the transmitted data is different for our application, the method of transmission is borrowed.

As networks broaden in size and the demands for bandwidth increase, we've turned to the world of IT to leverage Ethernet networks, building proprietary protocols for our own purposes. The good news here is that the network infrastructure hardware, software components and testing tools are so well established that we're welcoming second or even third generation skilled engineers to service them. This is our gateway to a highly-networked world.

Wireless technologies are also ripe for adoption, and in 2013 we will continue to see the rise of 'internet light bulbs', albeit with the surrounding confusion about the differences between 802.11 (Wi-Fi) and 802.15 (ZigBee) radio networks.

Another thing to watch in 2013 will be 'inductive power coupling', a technology popularised for charging electric toothbrushes and more recently mobile phones, which is also ideal for constant-current LED power.

So as 2013 dawns, what contribution can our industry make to the world from which it has borrowed so much? Perhaps it will be to use our collected technologies to help conserve the planet. They will make control of our lighting simpler and smarter, making it easier to save energy. 

● Sam Woodward leads Havells-Sylvania's lighting controls business unit

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Viewpoint

Eliot Horsman, sales engineer, ACDC

You never really own an LED...

LED technology should be valued as highly as a precision-made watch, and manufactured to similar standards

For some years, Swiss watchmaker Patek Philippe has had the slogan: 'You never actually own a Patek Philippe. You merely look after it for the next generation.' I only wish this applied more to the lighting business, especially when it comes to LEDs.

Rife in our industry are manufacturers that build mediocre fittings using budget components with the goal of bringing costs down. This way they can make a decent margin on projects and still offer a return on investment in the period their client desires.

I'm also doubtful when manufacturers use recycled materials for crucial components such as heatsinks. They tend to present this as being environmentally friendly, but the more cynical side of me wonders if it is simply cheaper, and whether a recycled metal can be credibly thermally tested.

A well-designed and well-engineered light fitting can be a beautiful item. The lit effect of a luminaire and its performance is crucial, but the overall quality of the manufacturing is essential too. The industry should demand that the kit we work with is as good as it possibly can be.

Shake, rattle and roll

The shake, rattle and roll of the poorly-built LED luminaire that we see all too often must become a thing of the past. Components machined from the highest grade aluminium and a lustrous anodised finish should be the norm.

To justify this high standard, however, we must treat LED lighting as a long-term investment and the start of a healthy relationship between manufacturer and client rather than a commodity item that requires a quick and simple sell. We mustn't expect users in any sector to simply throw away or recycle their LED fittings when they have reached the end of their L70 life or when they are having a refit.

Second life

When you invest in the sublime engineering of a luxurious watch, the manufacturer expects you to pay to send it back to be serviced in years to come.

It is then lovingly restored to its initial state and returned to its owner as it was when new. Why can't the same apply to lighting?

For example, take a retail client who has invested in LED downlights and after a few years has paid for the installation. The client is planning a refit, as is typical for a project in this sector. Ideally, the downlights should be sent back to the manufacturer to be refurbished and have changeable parts such as LED boards, drivers and spring clips replaced – but the main body of the fitting remains. That would surely be true sustainability. Another positive to consider is that fittings would be genuinely future-proof, because the latest, most efficient technology could be implemented each time they were returned.

This process could still take place even if the retailer is completely changing its brand image and no longer has a need for the downlights it originally purchased. We would then create a whole new market for cherished LED luminaires. Once loved


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'A well-designed and well-engineered light fitting can be a truly beautiful item. Quality of manufacturing is essential'

and now available as new at an agreeable price.

Markets that are currently finding it difficult to enter the wonderful world of LEDs would then have the opportunity to save energy that would otherwise have been consumed. The only concern would be the car salesman types in the industry having a field day.

Built to last

So if you're considering using the lighting equivalent of that digital watch with a hundred flimsy buttons that you had when you were eight (and which broke before you were nine), stop. Consider the long-term option and invest in the future. We should never actually own an LED. We should merely look after it for the next generation. 

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Athenaeum Hotel - London
Image courtesy of Projection Lighting
Fittings alphaLED/Projection Lighting

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Healthy savings

The prognosis is good for this NHS trust to hit its energy-saving target of 25 per cent, says **Pennie Varvarides**

Low-energy lighting is helping the trust save tens of thousands of pounds

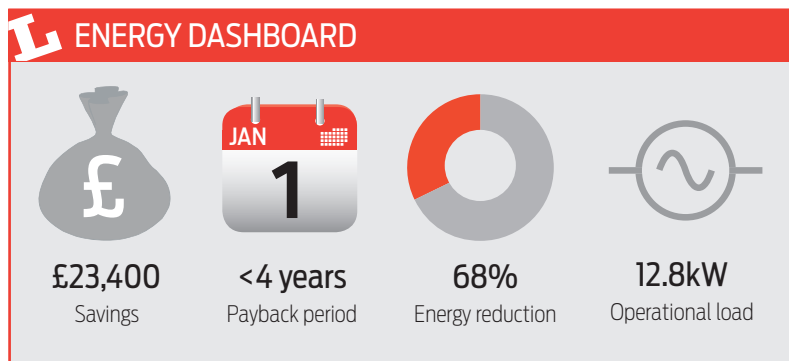


An NHS trust is expecting to save about £23,400 by retrofitting LED lighting into several areas at Brighton and Sussex University Hospital, recouping its investment in less than four years.

The teaching hospital is spread across two sites: the Royal Sussex County Hospital in Brighton and

the Princess Royal Hospital in Haywards Heath. The lighting upgrade for the Royal Sussex is part of the trust's commitment to become a leading low-carbon organisation in Sussex, and its target is a reduction of 25 per cent in energy use – and carbon emissions – by 2014/15 (from 2008/09 levels).

"The trust is committed to installing low-carbon





LED floodlights are making big savings in a hospital car park



solutions wherever possible,' says the hospital's PFI estates manager Barry Kearton. 'We identified LED lighting as a technology that offered considerable energy and cost savings with minimal disruption to our buildings.'

Lights in areas such as sterile services and IT departments are left on 24 hours a day for health and safety reasons; so energy-saving lighting can have a significant impact. Hygiene is also an important consideration; it is essential that luminaires can be wiped clean. The edge-lit LED ceiling panels installed at the Royal Sussex County Hospital have a single flat surface, so they are easier to clean than conventional four-tube fluorescent fittings.

LED panel manufacturer Light Planet says its product will work continuously for over 50,000 hours and cut energy consumption by up to 68 per cent.

Low-carbon ambition

The trust also decided to upgrade to LED alternatives in other 24-hour areas, such as toilets and car parks. Light Planet's 49W LED floodlights have been fitted in the car park, replacing the original 150W fittings, which had to be replaced every two years. The lower energy consumption, combined with a projected life of about seven years, has saved about £17,000.

Kearton adds: 'The LED retrofit has delivered not only the cost savings that we hoped to achieve, but has also made a valuable contribution towards reducing our energy consumption in line with the trust's low-carbon ambitions.' The hospital is now considering retrofitting the whole building. 🇬🇧



The LED ceiling panels are easy to clean



The trust is now looking to extend its use of LED lighting



Light changes in colour
temperature through the day

Shining a light on patient care

Good lighting schemes save money for cash-strapped hospitals, but they can also have a direct effect on the time it takes for patients' to recover, **Robert Bain** discovers

A dynamic lighting system from Philips is at the heart of a major project at Bradford Royal Infirmary looking at the effect of the built environment on dementia patients. Two wards at the hospital have been transformed to create a better environment for people with cognitive problems and dementia.

About a quarter of people who access acute hospital services in the UK have dementia – a figure that's set to double over the next 30 years as the population ages. In an effort to create more supportive environments for these people, the King's Fund has set up the Enhancing the Healing Environment programme with funding from the Department of Health. The programme aims to help nurse-led teams improve the settings in which they care for patients.

The idea of the Bradford project is that improving the way patients and staff interact and preventing patients from becoming agitated will make for a

better overall experience. Philips has worked with ward managers, clinicians and estates managers at Bradford Royal to incorporate lighting into the project.

A dynamic lighting system has been installed in both wards, using fluorescent lights that mimic the rhythm of changed in daylight. Research has shown that the level of some hormones in the body rise and fall in a daily cyclic pattern, which is maintained by our daily exposure to daylight and darkness. In this way, light helps regulate our biological clock, influencing many aspects of our physical and emotional wellbeing. The more time spent in daylight – or in artificial light that effectively mimics daylight – the better a patient's visual performance, comfort, mood, sleeping patterns, concentration, alertness and performance.

Dementia patients are particularly prone to erratic sleep patterns, often sleeping during the day and then finding it difficult to sleep at night – not good for



them or the nursing staff.

The dynamic lighting in Bradford has two roles: to create a bright and cheerful ambience in the wards and to keep patients active during the day so they sleep better at night. With that in mind, the system is programmed to start the day with a strong blue light in the morning, which gets warmer towards lunchtime, reverts to strong blue after lunch then becomes warmer again as evening approaches. Light with a high blue content increases the level of cortisol in the body, which makes people more alert and less inclined to sleep.

More relaxed

Ward manager Debbie Beaumont says: 'The lighting has helped the appearance of the ward so they look lighter, brighter and more welcoming. There's definitely a change in the way patients feel about their environment. They report feeling more relaxed and calmer.'

'The staff also seem to enjoy the fact they've got this lighting... It makes them think the area they work in is a little bit special, a little bit different. We've had staff walk onto Ward 23 to ask to work there, and they appreciate the fact that we are thinking about the patients,' she said.

The hospital also replaced CFL downlighters in corridors and patient areas of the ward with LED

LED downlights are saving energy in the hospital's corridors


fittings, saving energy and reducing the disruption caused when replacing lamps. The system runs on timers and there have been no repairs or failures in the year since the lights were installed.

Elsewhere in the hospital, the Philips HealWell lighting system has been installed in patient rooms – the first installation of the system in the UK. It provides gradually varying light levels during the day and combines this with ambient lighting that can be controlled by the patient using a touchpad.

The lighting has transformed the rooms and feedback from patients and staff has been positive. Early indications are that the lighting, together with other improvements, will help patients' recover.

Research by Philips and the medical centre at Maastricht University found that patients sleep on average about half an hour longer when using HealWell.

Lighting is just one part of the built environment that contributes to patients' wellbeing, but it's a crucial one, and one that provides a quick return on investment.

Sarah Weller of the King's Fund says: 'We all recognise the importance of good lighting for people with dementia, and any advances to improve artificial lighting schemes will clearly bring great benefits. We look forward to seeing the results of the Bradford Royal Infirmary trial with great interest.' 

All in a day's work

This prefabricated hospital unit, which includes low-energy lighting, was installed in under seven hours

Imagine fitting out an entire hospital room in just six and a half hours – including the bed, electrical wiring, medical gas supplies, nurse call system, storage and lighting.

That's what has been made possible at Newham University Hospital in East London with a trial installation of the Pod, a prefabricated patient environment developed by Integrated Medical Interiors (IMI), featuring lighting by Fagerhult and controls by Intecho.

Built off-site to the hospital's requirements, the quick and simple installation of the Pod is a big plus in a healthcare setting. The installation is in a new section of the hospital, part of a £1 billion investment by Barts Health NHS Trust.

Day and night

The Pod's lights are controlled using the nurse call handset, and a biodynamic lighting control system uses daylight sensors to determine whether artificial lighting is required, sequencing the type of light depending on the time of day. In the morning there is warm light which fades to a cooler light later in the morning then back to warm and eventually to off in the evening.

For nurses, an emergency switch provides 100lx for patient treatment or resuscitation, while a night-

Lighting changes according to the time of day

30%
ENERGY
SAVINGS



The Pod can be delivered and installed in a single day

time switch provides 10lx for routine care rounds.

Andrew Bissell from IMI said: 'We delivered the prefabricated Pod to site on the Monday and our team had it completely installed on the same day. There was nothing to cut on site, so no dust, and the whole installation only required the drilling of eight holes. In terms of infection control and minimising disruption to patients these are very significant advantages.'

Positive results

Bissell said: 'The light sources have been designed to be easy to replace and offer an 80 per cent reduction in maintenance costs as compared to traditional hospital lighting.'

Meanwhile a combination of the lighting specified and the control systems installed provides energy savings of around 30 per cent so this approach also makes sound financial sense for the trust too.'

The trust is in the process of collating staff and patient feedback, and it says indications so far are positive. 🇬🇧

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Sources of inspiration

Lux picks out five light sources creating new opportunities for OEMs in 2013



LED light engines to replace fluorescent

Forge Europa has launched LED light engines to replace fluorescent lamps in linear, round and square versions, with some impressive efficacy figures. The 270 x 35mm engine is designed for use in linear luminaires to replace fluorescent tubes, and can emit 6,500 lm in the same space as a 5-foot fluorescent. The 270mm square engine, and the round engine, which is designed to replace a 2D fluorescent lamp, have efficacies of up to 116 lm/W.

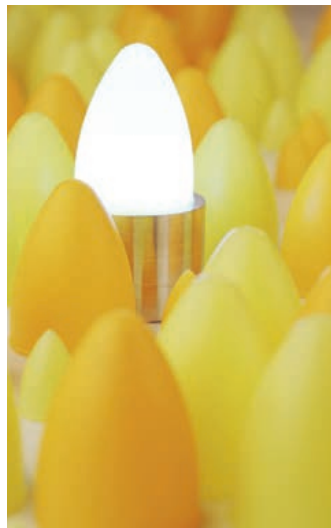
www.forge-europa.co.uk



High-performing remote phosphors

Intematix has increased the light output of its ChromaLit remote phosphor products by an average of 10 per cent, so OEMs can make products with fewer LEDs and smaller heatsinks. The ChromaLit Candle and Dome products also have better light quality and uniformity. Intematix's remote phosphors convert light from blue LEDs to white. Efficacy is up to 30 per cent higher than conventional white LEDs, the company says. Colour-rendering indexes are over 95.

www.intematix.com



Tuneable LED system from Tridonic

Users can adjust the colour temperature of Tridonic's tuneable white LED system to suit their needs. The Talexxmodule Stark DLE Premium can be controlled using Dali, DSI or Tridonic's switchDIM, which enables standard mains voltages to be used for dimming and switching. DLE Premium modules can be incorporated into a range of luminaires including downlights and spotlights, and can be used in scene-setting configurations. Tridonic offers a five-year guarantee.

www.tridonic.com



Fortimo: the next generation

The third generation of Philips' Fortimo LED SLM system is designed to create bright, vivid lighting from spotlights and downlights in retail applications. It comes with the latest chip-on-board LED technology and creates a powerful, compact and uniform light source for excellent beam control and small angles. The SLM Gen3 modules deliver high quality light and performance of over 100 lm/W on system level at application conditions. The modules are backwards compatible with the previous generation of spotlight modules and are Zhaga compliant.

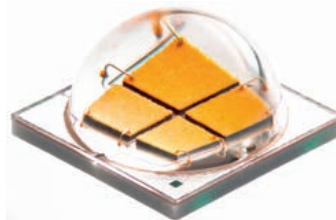
www.lighting.philips.co.uk



200 lm/W LEDs from Cree

Cree's XLamp MK-R LEDs can deliver up to 200 lm/W (at 1W, 25°C). The company hopes the chips will power high lumen applications such as outdoor and indoor directional lighting, including halogen replacement lamps. For systems that use multiple LEDs, MK-R enables manufacturers to use fewer chips, driven harder, without creating excess heat, and thus maintain output and quality. Built on Cree's SC3 platform, the MK-R LED has a 7 x 7mm footprint with a 6mm optical source and delivers up to 1,600 lm at 15W, 85°C.

www.cree-europe.com



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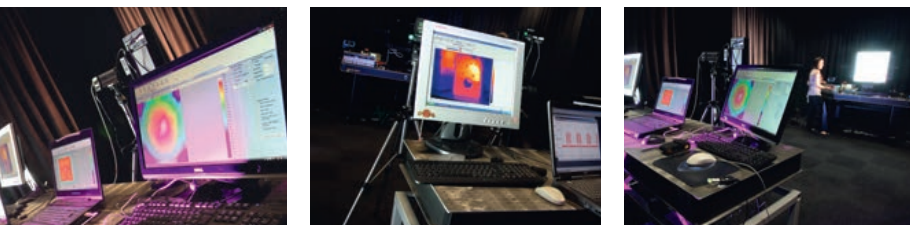
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The handrail has become a common example of integrated LED lighting, as seen in this exterior project at Essex Street Steps in London by DW Windsor

Where light lives

LEDs let designers put light where it has never been before. And allying solid-state lighting with other technologies opens up even more possibilities. **Francis Pearce reports**

While everyone, quite reasonably, bangs on about the energy-saving aspects of solid-state lighting, there is a tendency to overlook the fact that LEDs are changing the way we light our spaces. And, as designers move beyond simply replicating traditional housings and start exploiting the specific characteristics of LEDs – and eventually OLEDs – they offer a powerful potential to completely rethink illumination.

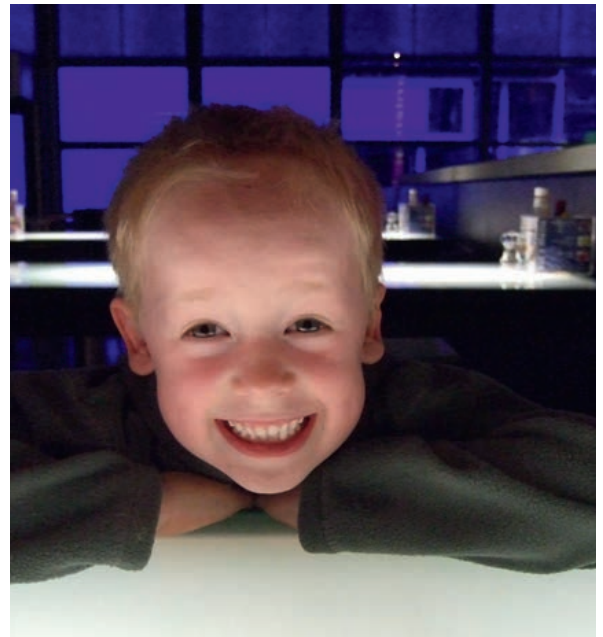
From the beginning, when LEDs first started to creep into schemes, designers explored the playful possibilities of easily controllable colour-changing light sources. The award-winning Finsbury Square scheme by MBLD, which features a colour-changing grid across a pedestrian square in London's City area, was a classic example of their ability to illuminate and entertain. Crucially, it was also an example of how their scale allows far greater integration than any other source.

Bijou bonus

Combined with their controllability and longevity, the bijou size and flexibility of LEDs allows them to be built into everything from fabrics to the fabric of buildings. Rather than being regarded as a separate entity, LEDs let lighting become an integral part of structural elements. The handrail has become a common example in both exterior and interior applications, creating a feature that is both functional and decorative, as well as space saving. In retail, it is no longer necessary to accent the shelf when the shelf itself becomes the light source. Rather than the subject of conventional pinspotting, tables in restaurants become glowing elements.

Although techniques such as backlighting and

Light incorporated into furniture – such as here at London's Science Museum – is one of the many new applications



underlighting are not new, the shallower recesses required by solid-state lighting, plus its greater controllability and longevity, lend them to a more lateral approach. They can be discreetly concealed, spilling light across stairs or seeping out from offset panels, or an overt graphic element, a spiralling slash of light across floor, walls and ceiling. In other words, LEDs let designers look at spaces in a much less constrained, much more three-dimensional way.

Obvious applications

There are obvious applications, such as leisure and retail, for exploiting LEDs' creative potential. But these little chips are also changing the interiors of more orthodox spaces such as offices, where the integration taking place is not just with the surfaces of the building. We have reached the stage where it is not necessarily the LED itself that is the star of the show, but the partnership of technologies that shines.

In November, Philips announced a second version of its combined acoustic and LED light-emitting ceiling panel for offices, called Soundlight Comfort Ceiling, which it developed with Saint-Gobain Ecophon. It can be used to create a uniform surface of light or islands of light that can be varied

»

'We have reached the stage where it is not necessarily the LED itself that is the star of the show, but the partnership of technologies'



Incorporating LEDs into the goalposts at this communal football pitch on the Boundary Estate in East London has encouraged locals to play football late into the evening and given the space a new lease of life. The self-illuminated goalposts are part of a wider relighting project in the area by the Helen Hamlyn Centre for Design at the Royal College of Art, London, supported by the Megaman Charity Trust Fund. The fund was set up in 2008 to support educational and environmental protection projects.

» according to daylight levels and occupancy, but it also absorbs distracting office noise, making it easier to hear speech over short distances.

The idea is that visual and aural comfort work together to make for a more productive and less tiring environment. Roughly half of office work is made up of tasks that require individual focus and concentration and, according to a 2010 study by the University of Lucerne, the biggest single complaint by office workers concerns noise from meetings and phone calls, not glare or poor lighting.

Demanding office environment

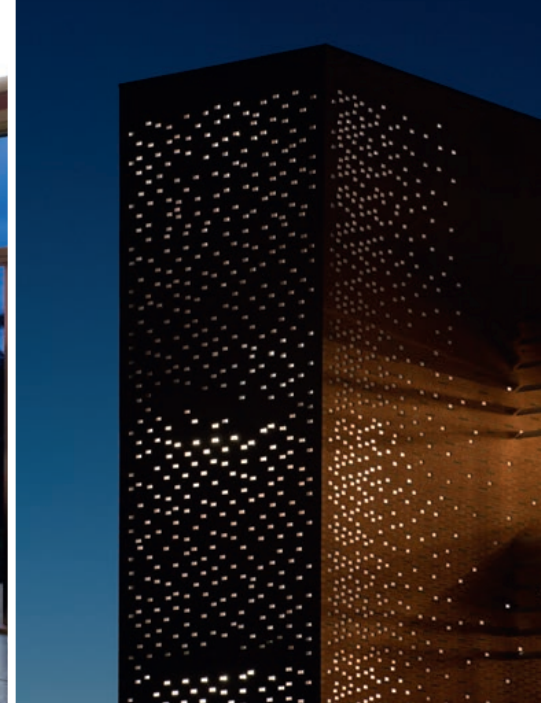
Ecophon president Gert-Jan van Doormalen says that in traditional modular suspended ceiling installations, acoustics and lighting coexist as two different systems. Combining acoustic performance with LED lighting offers 'new possibilities for architects and designers, but most of all it serves the needs of people who have to work in an increasingly demanding office environment'.

One of the unremarked aspects of office design that this counters is the habit that people have of personalising their space by adding shiny photographs and other reflective items that can bounce both sound and light where it is not wanted. Philips also recently launched sound-absorbing

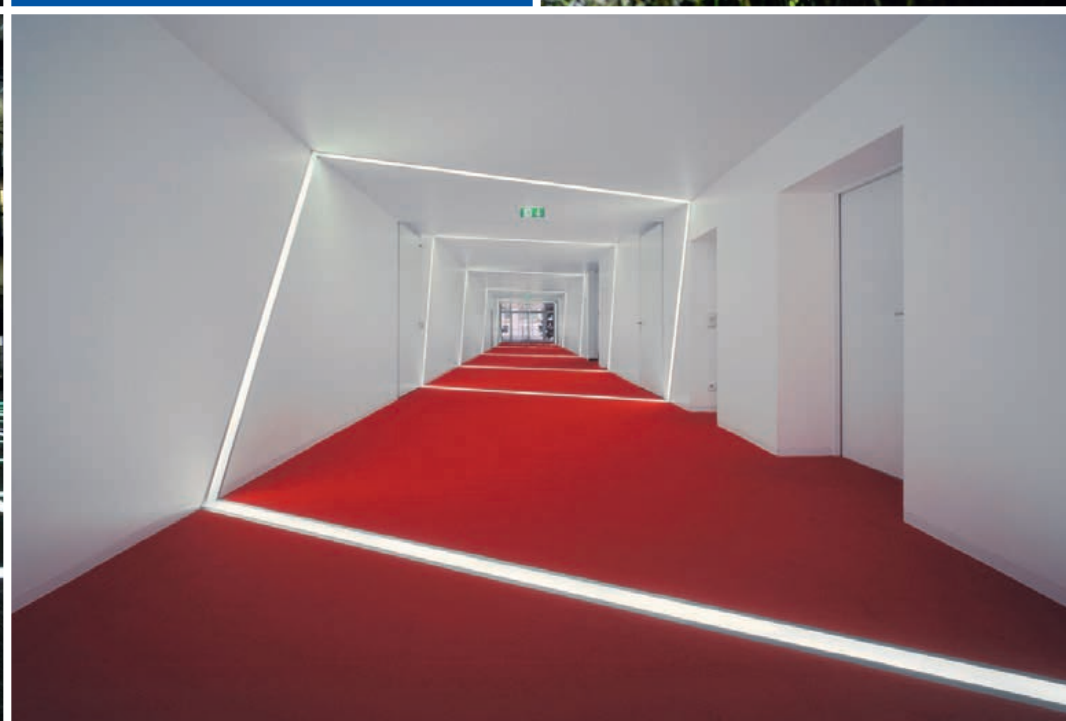
luminous textiles consisting of multi-colour LEDs with a 60mm pitch fixed on acoustic foam, for walls. This Luminous Textile can be installed as part of a building's original design, or as a post fit-out solution. The product can control sound absorption and create a welcoming atmosphere in applications such as bars and airport lounges with dynamic lighting controlled over Ethernet.

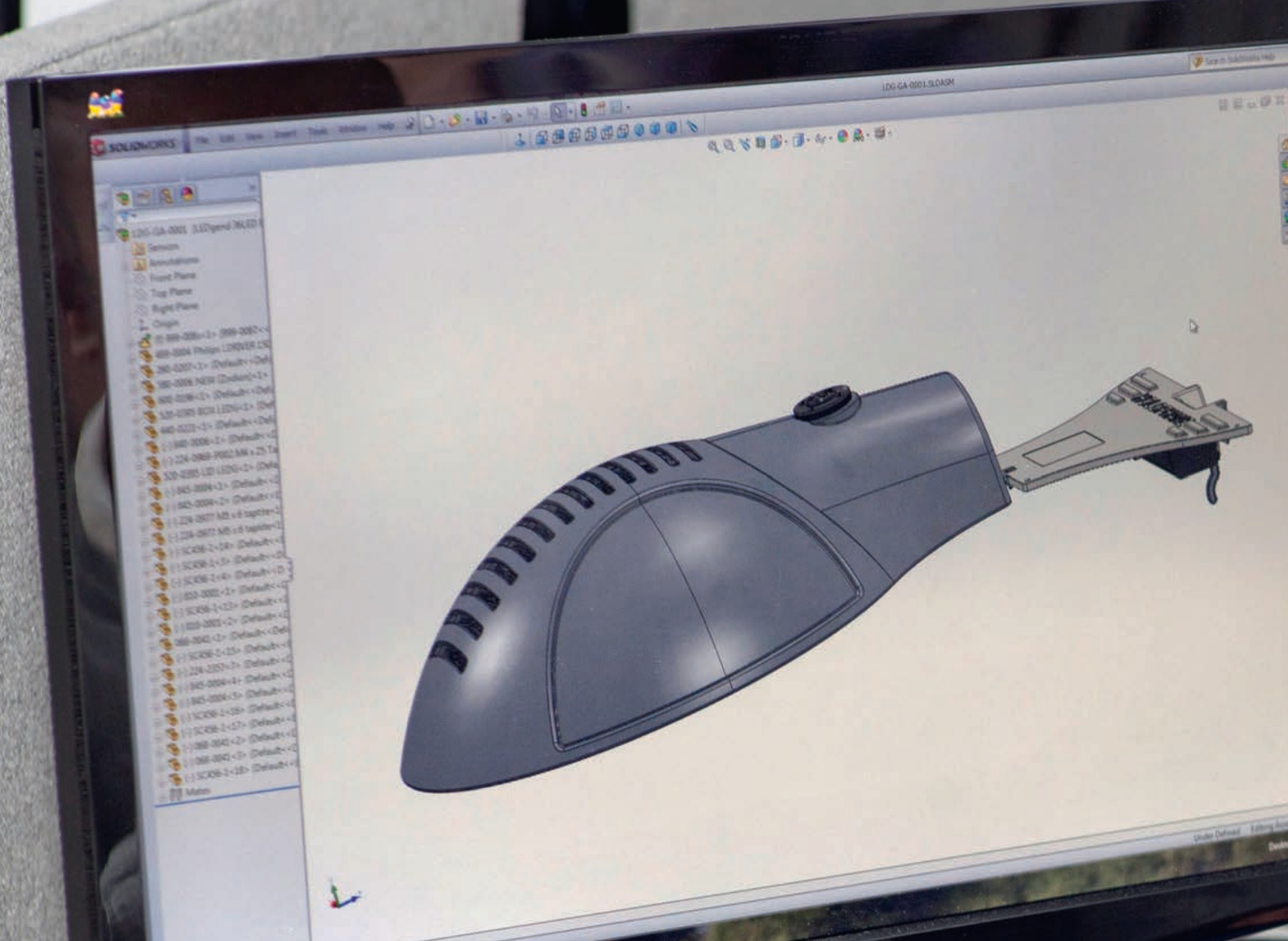
Other dual-function, dual or multi-technology roles for LED lighting are also being realised. So here we have a disruptive innovation, solid state lighting, which is allying itself in unexpected ways with other technologies. Building LEDs into fittings and surfaces is just the start – merging LEDs with other technologies will be the real game changer, particularly for the lighting designer, whose collaboration with other members of the design team, from architects to acoustics experts, will increasingly be vital. 🇬🇧

Clockwise from top left: OLED as windows, pic courtesy Osram; Hanson HQ, UK by Pinniger & Partners; garden, Essex, UK by David Atkinson, pic by AmbientLight; corridor in office, Germany; Finsbury Avenue Square, London by Maurice Brill Lighting Design, pic by Ray Molony; illuminated tables at the Science Museum, London by Rogier van der Heide.



‘Building LEDs into fittings and surfaces is just the start – merging LEDs with other technologies will be the real game changer’





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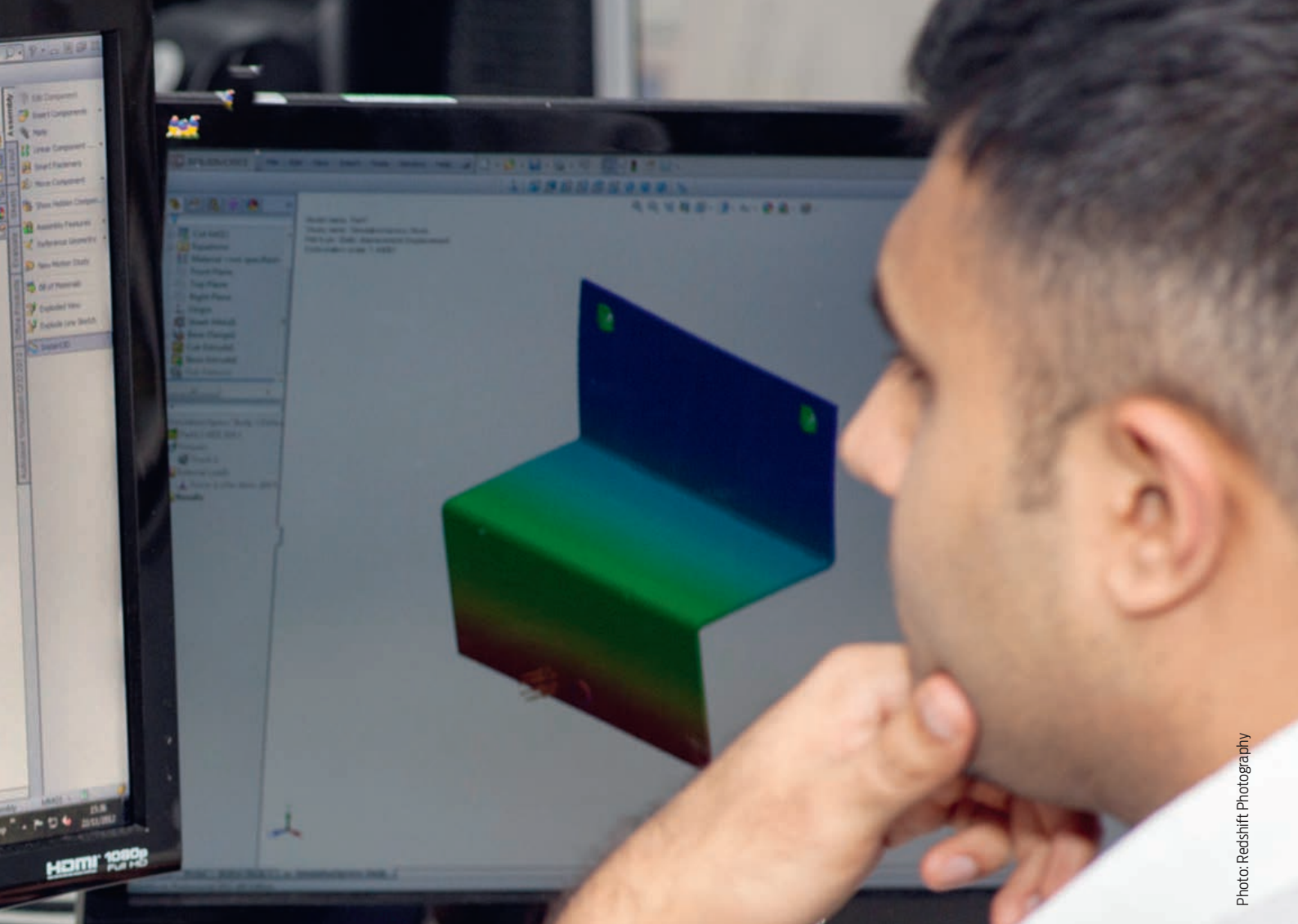


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On the right track

Creating an environment suitable for intricate work is hard enough without having to worry if your luminaires can handle the pressure. **Pennie Varvarides** visits a motorsport workshop



Fortec Motorsport has been racing for over 20 years and has teams in six championships including Formula Renault and Formula BMW.

In recent years, team manager Steve Lynch has seen impressive growth at Fortec. To keep on top of expansion, the company looked into increasing the space available for engineers at its workshop. The answer was to split the workshop into two floors by creating a mezzanine level. This meant new lighting was needed to illuminate the ground floor, where precision maintenance work is done on the cars.

The workshop floor is split into bays, each of which can take one car. Downlighting and spotlighting must be focused on the engine and chassis of the vehicles. There are also several workbenches around the building for more delicate work. General illuminance of 400 lx was required, with 500 lx at workbenches and over the cars.

Cars are in the shop for 10-12 hours a day for

Manager Steve Lynch wanted a comfortable environment for his team

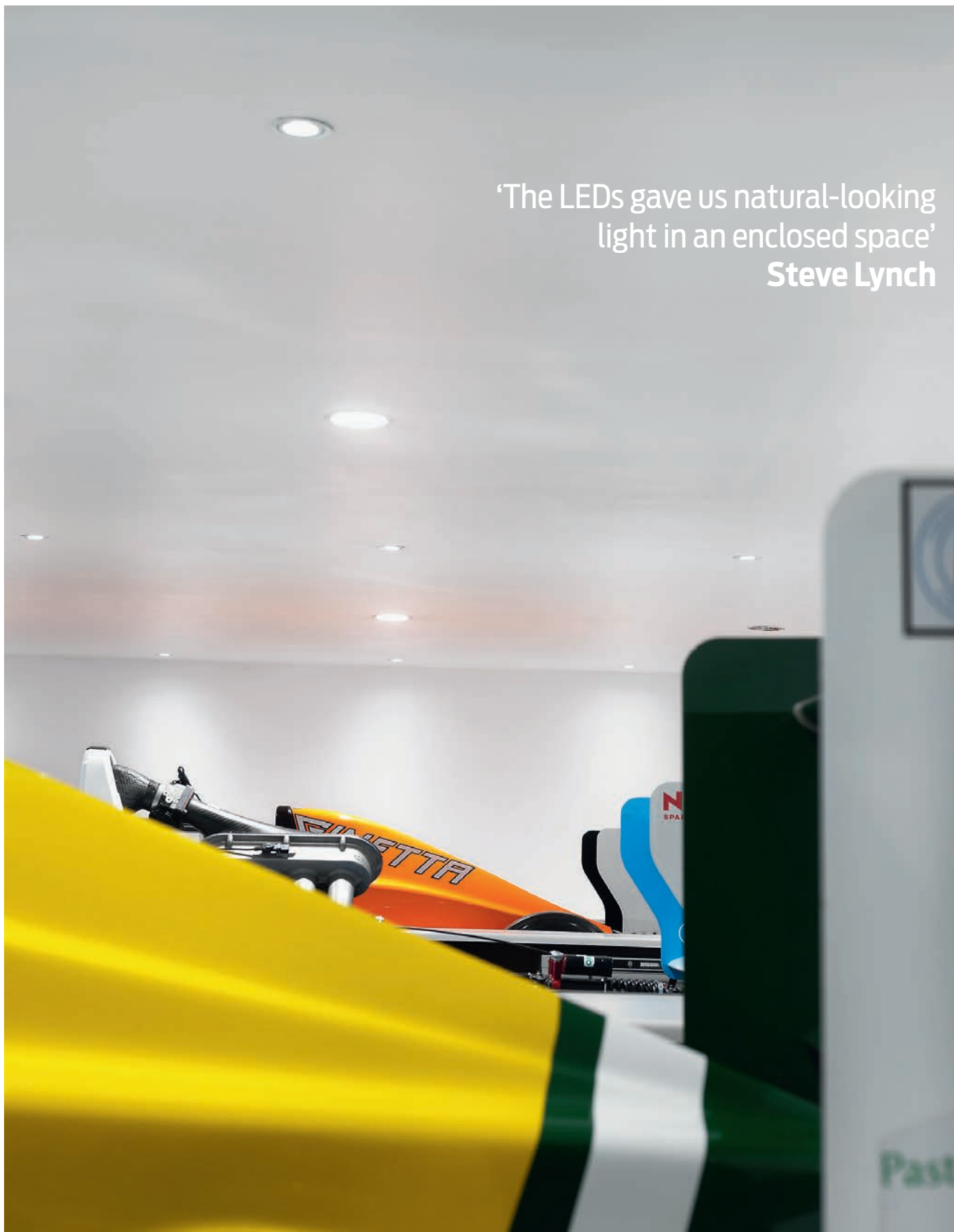
maintenance and fine-tuning. The mezzanine level is used as a working mechanic's shop, so the lighting there has to cope with long operating hours and constant vibration. Durability was important so that regular lamp changes wouldn't be needed.

Comfort counts

The new lighting also had to satisfy one more requirement: comfort. Lynch wanted to ensure his team was comfortable throughout the working day. He wanted lighting that felt like daylight, yet wouldn't generate excess heat. That meant halogen was ruled out quite quickly, and Lynch's installer suggested LEDs from Toshiba. To ensure the LEDs were suitable for the job, the lamps were first installed in a small area of the ground floor ceiling.

'We were worried that indoor lighting can feel unnatural,' says Lynch, 'but the area in which we tested the LED sources showed us great results, giving natural-looking light in an enclosed space.' »

'The LEDs gave us natural-looking
light in an enclosed space'
Steve Lynch





» The test was a success, and two large spotlights were installed in each workshop bay with smaller spots fitted over the workbenches. The company liked the new lighting so much that it replaced its halogen lamps with Toshiba's E-Core GU10 6.5W and E-Core 3000 downlights – cutting energy consumption by two thirds. The total lighting load is 1.46kW across 243m², which gives 6.01W/m².

The required 400 lx was achieved across the space, but the lighting still had to hit 500 lx on workbenches and over cars.

In tune with nature

Fortec wanted a natural look to the room. A colour temperature of 3000K would have been too warm to provide the right look and feel to the space, and a slightly cooler light also helps provide a feel of clean operation. In the end, a temperature of 4000K was specified throughout.

Colour rendering was also important because of the cars' bright colours. The cars are colourful and these colours need to be rendered as accurately as possible. The Toshiba LEDs provide colour rendering of 80 or above, and perform particularly well in rendering deep red colours. It also helps with skin pigmentation: not only does the room and colours in it look natural, but the engineers' skin tones are natural too.

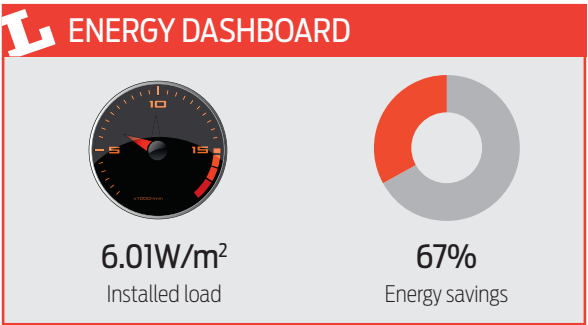
Another important aspect to consider was delivering good light on the cars and the

Careful positioning of luminaires helps avoid shadows

workbenches without casting too many shadows. Careful positioning of the lights enables this.

Fortec is now considering LEDs for another of its buildings. Lynch says: 'LED lighting is a perfect solution for us. We can save money on energy, and we're happy knowing that we're reducing our impact on the environment. Having vibration-proof, long-life lighting is perfect because we know it can take the heavy, constant use that's required in a working racing workshop.'

'The project required a full refurbishment of the ceiling and the lighting,' says Lees. 'As such, there was no straight swap, so a comparison between the old lighting and new lighting cannot be done. However, we have to consider that parts of the ceiling form the underside of the mezzanine above, which is subject to vibration, and would have caused the old lamps to fail prematurely. This is now a problem of the past.'



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Ten reasons why LED prices are falling

Ray Molony lists the factors that are driving down the prices of LED sources

1 INCREASED COMPETITION

The dominance of the Big Three lamp makers of Philips, Osram and GE is being challenged by new entrants to the global lighting market including Cree, Panasonic, LG Innotek, Samsung, Nichia and Toshiba. This reduces margins, especially on the latest products because they lose their uniqueness rapidly.

2 STRATEGIC CUTS IN MARGIN

The big players are increasingly 'buying market share' by slashing their margins. This keeps their factories busy (and lets them retain skilled staff) while putting pressure on their competitors to respond. And because the big manufacturers tend to have deeper pockets than newer entrants, it works to their advantage.

3 CHINESE GOVERNMENT POLICY

Successive Chinese governments have regarded LED lighting and components as a key area for growth. Consequently, they have provided a range of incentives to manufacturers, including tax breaks, subsidies of up to 70 per cent on key machinery such as chemical vapour deposition machines, and low-cost or free land.

4 DEMAND IS WEAK

Despite the hype and the increasing adoption of LEDs, demand remains weak and patchy. This is partly because of the still comparatively high price of LED lighting compared to cheap incandescent, halogen and fluorescent sources, and partly because of the economic slowdown in the US and the Eurozone. As prices fall, demand will rise.

5 OVERCAPACITY

Many manufacturers have geared up for rapid growth in LED lighting, and demand hasn't yet caught up, causing a large oversupply. For

instance, Samsung is currently operating at about 60 per cent capacity and LG – which has invested some £580 million – is only using half of its LED manufacturing capability.

6 GREATER EFFICIENCIES

Put simply, as LEDs become more efficient you need fewer of them in a luminaire. Also, there are manufacturing savings: heatsinks become smaller, the capacity of the drivers come down and the luminaires become physically smaller, cutting manufacturing costs. These savings are then passed on to the customer.

7 THE SEMICONDUCTOR IS LESS DOMINANT

Not so long ago the cost of the LED semiconductor chip represented most of the cost of an LED luminaire. That's not true any more: now it's about 20 per cent of the overall cost, and innovations in the wider semiconductor manufacturing industry are reducing the costs of making LEDs even further.


8 SUBSIDIES

Where once utility, municipal and government subsidies were applied to compact fluorescent lamps, they are increasingly being applied to LEDs, especially in the US. Possible subsidies under the Market Transformation Programme in Europe are also being discussed. These drive up volume and reduce prices.

9 INCREASING VERTICAL INTEGRATION

Vertical integration is the process by which manufacturers make the components as well as the final product. That's happening in the lighting business. LED makers such as Philips, Osram and Cree are buying luminaire firms, and in turn selling 'lighting solutions' which are, after all, what customers want. Cutting out the middleman lets them reduce prices.

10 THE MOVE TO GALLIUM NITRIDE

A new technology of making gallium nitride LED chips on silicon wafers instead of sapphire or silicon carbide could make prices really tumble as more manufacturers make the switch and widespread adoption takes off. Tom van den Bussche of Bridgelux estimates that using silicon wafers could cut costs by 75 per cent. 



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How to save £13k on car park light

The University of Warwick has slashed its annual electricity bill in one of its car parks by more than three quarters. **Pennie Varvarides** finds out how



Aging yellow sodium lamps have been replaced with modern alternatives at the University of Warwick's central campus multi-storey car park.

The four-storey car park has 400 spaces and is used by the university staff and students, as well as members of the public who attend events at the adjacent Warwick Arts Centre. The space was originally lit by Holophane's Parkpack sodium units, and it was bathed in a 24/7 orange glow, regardless of whether anyone was inside.

Gary Price, electrical services design engineer at the university's estates office, says: 'We knew there had to be potential for a massive saving in energy use if we could cut out the unnecessary use of lighting.'

The Denver Elite Wall fitting is available in HID, CFL and LED versions



Old bodies, new sources

The university turned to LEDs and controls to help it hit its energy conservation targets. The luminaire bodies were in good condition, so electrical contractor Drakeset replaced the SON gear trays with new retrofit 56W LED units with programmable drivers. The units were redesigned to accommodate Philips Fortimo LLM modules.

Lighting control was achieved using Ex-Or BattenFit batten-mounted detectors in each luminaire. These hold the light output of the luminaires to 10 per cent and brighten to full output only when activity is detected. When the area is vacated they dim back down to 10 per cent after a two-minute delay.

A further 81 new LED luminaires were installed in areas previously left in darkness.


Vandal-resistant Denver Elite Wall LEDs from Holophane are fitted in the stairwells, and the Aeris LED was used on the top floor. The fittings are IP65-rated against dust and moisture ingress. The DSI and Dali-compatible sensors detect activity and monitor daylight.

All-LED building

Price says: 'We have ended up with a lighting system in this car park that provides more widespread illumination, delivers white light, and provides a safer environment – yet manages to save us more than £13,000 off our annual energy bill.'

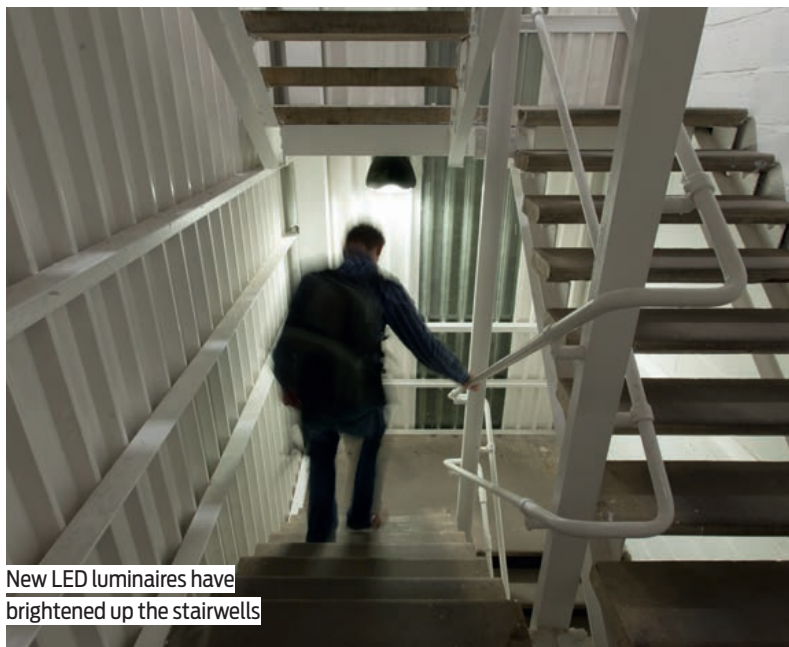
This all made for the university's first all-LED car park.

The upgraded lighting cuts electricity consumption at the car park from 19.7 to 4.62kWh, significantly reducing its energy bill and carbon footprint. This represents a financial saving of over £13,000 a year, based on typical electricity costs of 10p/kWh. On top of the cash savings, the university has also slashed its CO₂ emissions by 72 tonnes a year, which Price says is a 'significant achievement'.

Controls from Ex-Or have been used in a further three campus car parks, boosting total annual savings to £50,000. 

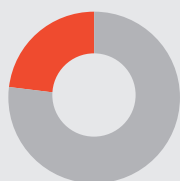


The new lighting responds to daylight and occupancy



New LED luminaires have brightened up the stairwells

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Energy reduction



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Annual energy savings

Hopwood Hall College



Hopwood Hall College runs a range of degree and diploma courses at its Rochdale and Middleton campuses. When designing the new college car park it was decided that LEDs would be the best option, based on their energy-saving potential.

But the lighting didn't just have to keep electricity costs down, it had to provide good quality of light for staff and students. The road to the new car park has been lined with LED Denver Elite Bollard fittings from Holophane and the main parking area uses Holophane's Factor LED column-mounted lanterns, delivering 11,000 lm in a combination of asymmetric and 'long and narrow' distributions.

At the campus end of the car park, perimeter lighting is provided by Denver Elite Wall LED fittings, from the same luminaire family as the entrance lights.

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Aludra LED installed at new Co-Op distribution centre, Nottinghamshire



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What's trending on Lighting Talk

LED dimming, lighting and street crime, unsafe GU10s, abuse of the CE mark and dodgy LED tubes are some of the hot issues on LinkedIn's Lighting Talk this month

The industry's most active discussion board has been abuzz this month as lighting professionals raise their concerns about substandard LED tubes and GU10s, let off steam about abuse of the CE mark, and give their opinions on lighting and crime.


The new Lighting Talk group has been an instant hit on LinkedIn proving there has been a real need for an industry forum independent of the major manufacturers.

Focal point

The group has been established by *Lux* to provide a focal point where people can air their views, get answers to questions and join in lively discussions. The group is moderated by *Lux* magazine to ensure sales messages and spam are excluded.



Top experts and professionals – including the *Lux* team – are on hand to give advice, guidance and opinion. People who post frequently – or 'influencers' – include Martin Valentine, lighting expert with the government of Abu Dhabi; Mary Rushton-Beales, independent lighting designer; Gordon Routledge, publisher of *Lux Review*; and tech expert John Mercer of CP Electronics.

There are around 400 members at present – and the group is growing fast. So join in by clicking on Groups on LinkedIn and searching for Lighting Talk. 

Get involved in the discussion on LinkedIn

Lighting Tqk

QUESTIONS AND COMMENTS THIS MONTH



LIGHTING AND CRIME

Eddie Henry, Southwark Council: Twelve years ago I delivered a lighting scheme on a high crime council estate; Maybe a coincidence but crime levels fell immediately and still show no signs of returning. The area was perceived as high risk and now the community holds functions on the green.



LED DIMMING

Liz Peck, independent designer: The main problems with dimming of LEDs seems to be incompatibility between luminaires, drivers and control interfaces. Lighting designers will (read 'should') ensure that the manufacturers of all the components have agreed compatibility, but when that spec gets broken, all hell breaks loose.



LED STREETLIGHTING

Martin Valentine, Municipality of Abu Dhabi: I had to explain to one seriously angry gentleman threatening court action that the new cooler LED lighting installed opposite his house to replace the SON that had been there for years wouldn't, contrary to what he'd been reliably told, cause cancers in his children.



LEDs AND HEALTH

Mary Rushton-Beales, the Lighting Design House: Is anyone taking seriously that French Defra report about LEDs causing macular degeneration? Because of it I am nervous of specifying any LED task lights. Love to have feedback.



Kevan Shaw, Kevan Shaw Lighting Design: 'I note Megaman has just published a piece on the effects of CFL on migraine sufferers. I wish more lighting companies would start to look at the potential problems rather than only research potential benefits of new lighting technologies.'

Getting to know Leni

A new way of estimating lighting energy consumption has got the thumbs up in a consultation on revisions to the Building Regs. **Robert Bain reports**

Have you met Leni? It's the new method of predicting lighting energy consumption in a building, which the lighting industry pushed to be recognised in the latest version of Part L of the Building Regulations.

And Leni has had some good news: it got a positive response in the government's consultation on the Building Regs, which took place early last year, with responses published in December.

Suave and sophisticated

Leni (the Lighting Energy Numerical Indicator) is a method of predicting the energy that will be used by a lighting scheme, based on a fairly complex calculation that takes into account things like daylight and occupancy as well as the luminaires and controls being used. It can be done by taking a few measurements and details about your lighting scheme and building, and putting them into one of various lighting software packages that are equipped to do Leni calculations.

Leni produces a figure in kWh/m²/year. The new regulations will set different limits for this figure based on how a space is used, ranging from 1 for an area only lit occasionally at 50 lx, to 155 for frequently used, brightly lit areas – or more for




The lighting controls used in this E.On building would be factored into a Leni calculation

for new non-domestic buildings. Most said 'don't know' (not surprising since Leni is specific to lighting and rather technical) but of those who did answer, more than 80 per cent were in favour. Good news, since the lighting industry fought hard to have Leni included. Among building occupiers, property managers and building control bodies who responded to the consultation, the figure was an even more encouraging 100 per cent.

Nobody's perfect

There were, however, some reservations – for example that Leni doesn't take sufficient account of varying daylight availability or measures like solar shading, and that it could be abused by engineers tweaking the data they put in (for example overestimating operating hours) to make sure they hit the right numbers. The Lighting Industry Federation (now the Lighting Industry Association) pointed out that assumptions made about light output ratio in the calculation could discriminate against some luminaire designs.

The industry is now anxious to get its hands on the final draft of the new Part L, expected in the spring, and start preparing for it to come into effect, which the government says is likely to happen in the autumn. A survey conducted recently by GE among 400 UK manufacturers (see page 7) highlighted uncertainty over energy use as one of the biggest concerns for businesses – and lighting is one of the first places they look to improve efficiency. 

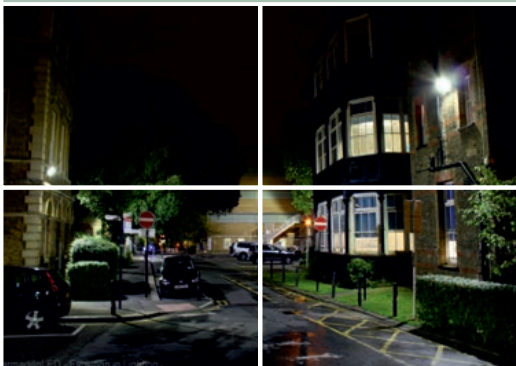
'Of those who expressed a view, more than 80 per cent were in favour of introducing Leni'

display lighting.

It's a much more sophisticated, nuanced way of measuring lighting energy than the old method of just adding up how many lumens per watt each luminaire squeezed out. The plan is to introduce Leni as an alternative minimum standard – in other words your lighting either needs to have an overall efficacy of above 60lm/W_{cct} (up from 55 in the previous version of Part L, but reduced to as low as 42lm/W_{cct} when controls are in place) or it needs to consume less than the appropriate maximum defined by Leni.

The consultation conducted by the Department for Communities and Local Government asked respondents if they supported introducing Leni

Industrial



LED



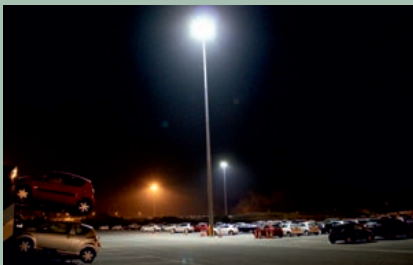
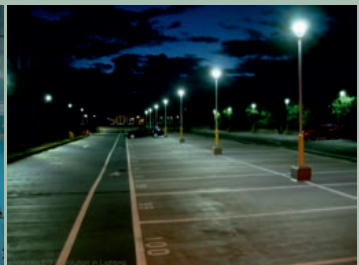
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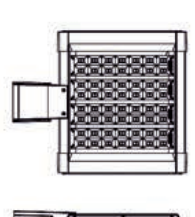
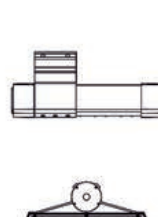
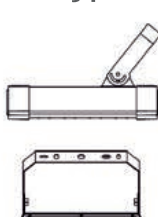
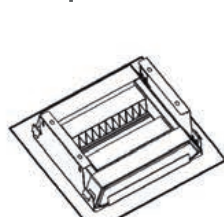
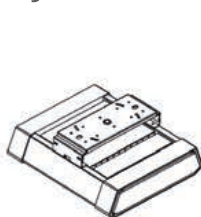
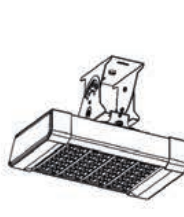
Replace
250W-with Amethyst 120W
400W-with Amethyst 180W
Increase Light - meet CIBSE guidelines



| Lamp | POWER (W) | No. LED / Module Q-TY | Layout | Lumen TESTED (lm) |
|-----------------------|-----------|-----------------------|-----------------|-------------------|
| Amethyst-030 - Series | 30 | 14 / 1 | 14 x Cree XP-G | >2300 |
| Amethyst-060 - Series | 60 | 28 / 2 | 28 x Cree XP-G | >5200 |
| Amethyst-090 - Series | 90 | 42 / 3 | 42 x Cree XP-G | >8100 |
| Amethyst-120 - Series | 120 | 56 / 4 | 56 x Cree XP-G | >11200 |
| Amethyst-150 - Series | 150 | 70 / 5 | 70 x Cree XP-G | >13800 |
| Amethyst-180 - Series | 180 | 84 / 6 | 84 x Cree XP-G | >17000 |
| Amethyst-210 - Series | 210 | 98 / 7 | 98 x Cree XP-G | >19900 |
| Amethyst-240 - Series | 240 | 112 / 8 | 112 x Cree XP-G | >22800 |
| Amethyst-270 - Series | 270 | 126 / 9 | 126 x Cree XP-G | >25800 |
| Amethyst-300 - Series | 300 | 140 / 10 | 140 x Cree XP-G | >28700 |



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FloodLight Tilt

HLB
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CSM
Canopy Surface

CRM
Canopy Recessed

FLA
FloodLight Arm

LPM
Lamp Post

WM
Wall Mounted



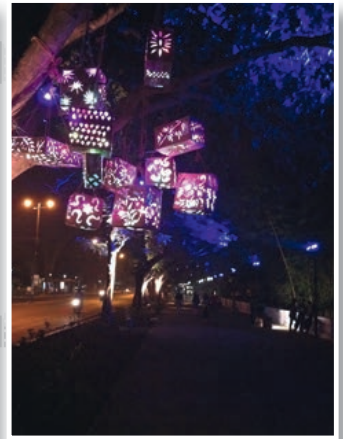
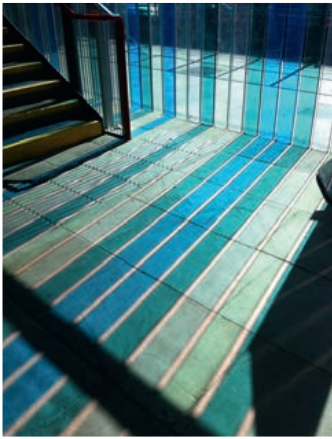
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Your invitation to become

Martin Lupton and Sharon Stammers of Light Collective present LightCollector
– an app developed with Philips to help designers share their lighting inspiration



Light Collective and Philips have set out to create the ultimate visual resource for those seeking inspiration on lighting. The LightCollector app aims to create a crowdsourced photo collection for the lighting industry by letting users upload photos and view those uploaded by others.

We believe inspiration can be found in virtually everything. We also believe that sharing is crucial and we want to encourage people to communicate the inspiration they get from the amazing and colourful world around us.

A global community

The LightCollector app came out of the idea of creating a global online community that would record, document and analyse the lit environment. We saw LightCollector as an opportunity to create a crowdsourced global image collection and the development of a resource that fits with our vision of the way forward for the professional lighting industry; sharing to aid greater

knowledge, ease of working and collective creativity.

LightCollector is a tool for sharing lighting inspiration wherever and whenever you find it. We know how often we trawl our image library to find the

a light collector

perfect image to illustrate our concept to a client. We know that somewhere, in the depths of our not-quite-adequately filled hard drive we have that photograph we once took, in that city we once visited, of daylight transmitted through a stained glass window, creating an explosion of colour on the floor. LightCollector lets you collect, share and easily find these light-based images.

Ideal partners

Light Collective and Philips have been developing the app over the past 18 months. When we approached the Philips Lighting team, the LightCollector idea fitted with many of their aims in supporting the lighting industry and helping to facilitate better working practices. Philips is an ideal partner to bring a project like this to life because of its international reach and community of lighting professionals.

Of course, the success of LightCollector will depend on lighting creatives and specifiers building the resource by uploading and sharing images. We therefore invite you to join us and become a light collector. Help capture the incredible visual images found in lighting design, light art, architecture and the natural world. Together we can build the ultimate resource for those seeking lighting inspiration.



Visit www.light-collector.com
to get started

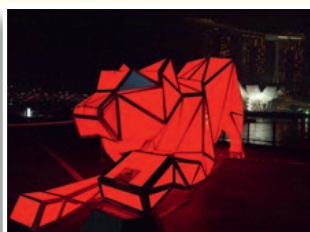
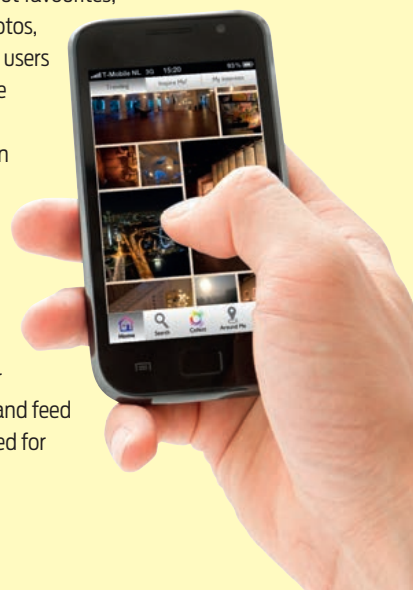
How it works

You can download the LightCollector app to your Android or Apple device, and there's a browser-based interface for computers too (www.light-collector.com).

LightCollector presents a continuous mood board of uploaded images, which you can scroll through for inspiration. You can use filters to narrow it down to categories such as architectural, functional, artistic or natural light. Photos can be geotagged, so you can look at ones taken near where you are, or search by location.

You can pick out favourites, comment on photos, and follow other users to see their entire photo streams.

The result is an easy-to-use mobile app that will enable lighting and design professionals to speed up their image searches and feed their creative need for inspiration.



Reach for the sky

Satellite broadcaster Sky has implemented an ambitious scheme for efficient yet attractive lighting at its student studio



Sky is letting schoolchildren and students write, shoot and edit their own TV reports in a special studio at the company's new headquarters in West London. And the Sky Skills Studio is lit exclusively by LEDs.

The design brief specified that the lighting had to be based on energy-efficient sources but still create a 'wow' factor. David Atkinson Lighting Design (DALD) worked closely with branding agency RPM throughout the design process.

There are four TV studios with green screens, a central production space and a dressing room.

Dressing in style

To give the dressing room a showbiz feel, four internally illuminated stars in vibrant colours are mounted on the walls. The principal light source in the space is a large landscape vanity mirror surrounded by an array of LED golfball lamps. There are also two giant anglepoise lamps.

The main production space consists of a suspended light box that is backlit by strings of colour-changing RGB LEDs. A truss that surrounds the light box supports a series of RGB automated fittings that are programmed to wash the central floor

The four studios are glazed and edge lit with RGBA LED strips from the top and bottom

in a contrasting colour to give the space a dramatic feel. The central TX control desk is lit by high-intensity LED fittings.


The four studios around the perimeter are glazed and edge lit with RGBA LED strips from the top and the bottom of the glazing. A matrix of dots printed on the inside face of the glass enables the light to wash the glazing and creates an opalescent quality, masking the view into the studios. Dimming the lighting to the glazing lets the audience see in.

Picture perfect

Each studio is equipped with LED lighting for the green screen space. Good lighting is essential to capture good quality high-definition pictures and it has been balanced accordingly.

Architectural feature lighting includes RGB LED strips in the walls, control desks and floating ceilings above the edit suites. Task lighting comes from recessed LED downlights set into suspended panels.

Various lighting sequences have been programmed into a DMX replay unit that is triggered by the show control system.

Lighting ties together all the elements at Sky Skills Studios, creating an inspiring visual experience. 

LIGHTING SUPPLIERS AC Special Projects, Commercial Lighting Systems, Gekko, GLP, Jands, LTH SquareLED MJ Lighting, Osram, Reggiani, Robe, Spanlite, Spotlight, Zero 88



The design brief specified that the lighting had to be based on energy-efficient sources but still create a 'wow' factor





Why Next's begun a £4m light revolution

Join us at our special conference next month to hear why top high street retailers are breaking ranks to transform their lighting and save millions

Lux is here to make sure you don't miss the retail lighting revolution. Our special one-day Retail Lighting and Energy conference on 28 February is designed to help you gain that competitive edge by learning how to deliver world-class stores that work on every level.

The conference, organised in conjunction with Retail Property Analyst and the British Council of Shopping Centres, brings together the top names in the business. These experts will show you how to make dramatic reductions in energy using the latest lighting tech, while boosting sales and improving your brand image.

You'll hear directly from top names such as Next, whose national shopfitting manager **Peter Bowman** will give the rationale for their ambitious £4 million retrofit of halogen lamps with LED.

There's be a special report from the new Waitrose/John Lewis At Home outlet in Ipswich, the first totally all-LED store for the company, and the first to have an installed load of under 10W/m². It will be followed by a panel Q&A with the team behind the project, including **Barry Ayling** of John Lewis.

A senior executive from the energy team at Sainsbury's will outline the company's sustainability strategy and its implementation across the estate, including the key role of



Cavendish
Conference Centre,
London
(Oxford Circus tube)
Thursday
28 February 2013

various lighting technologies.


Retail psychologist **Dr Katelijn Quartier** of Hasselt University in Belgium will outline the latest research into how lighting affects customer behaviour. Top retail lighting designer **Gary Campbell** will explain the key attributes of retail lighting and the issues to consider before undertaking an upgrade to LED.

The conference will teach you how the right light can turn you into a sustainable and successful retailer. It will highlight the opportunities for retrofitting LEDs – and why the big retailers are making the move.

The one-day event will cover sectors ranging from fashion to food and from the high street to out-of-town. If you're a retailer, facility manager, energy manager, lighting designer or manufacturer then you'll want to be there.

The day kicks off with **Bill Wright** from the British Council of Shopping Centres revealing the results of the council's research into energy use in retail and the huge opportunities for lighting to make savings.

Experts including ex-M&S energy chief **Mervyn Bowden** will discuss ways to overcome the barriers to installing efficient lighting.

The biggest names in retail are leading the way in low-energy lighting. This is your chance to join them. 

● www.retaillightingandenergy.com



THE PROGRAMME

THURSDAY 28 FEBRUARY 2013

9.00am

Welcome and results of *Lux* magazine survey of high-street lighting.

Session 1: Cutting energy in retail



9.10am

Keynote: The opportunities for savings

Bill Wright of the British Council of Shopping Centres reveals the results of the

council's major research into energy use in retail and assesses the opportunities for making savings with lighting.



9.40am

Refurb or retrofit?

David Tilley of NRGStar weighs up the two options: can a straight lamp retrofit deliver better savings than a

full lighting refurbishment?

10.10am

Store project report: Next

Peter Bowman, national shopfitting manager at Next plc, explains the concept, rationale and execution of the chain's ambitious £4 million LED halogen-replacement programme.



Session 2: LEDs – The opportunities

11.20am

What they don't tell you about LEDs

What's the current state-of-the-art with LEDs? What are the pitfalls? And when is the right time to jump? Gordon Routledge of *Lux* magazine reports.

11.50am

LEDs and the 'look and feel'

Leading retail lighting designer Gary Campbell, London partner at DPA, explains the key attributes of retail lighting. He will describe the strengths and weakness of the main light sources and their applications, as well as the issues to consider before undertaking an upgrade to LED.

12.30pm Lunch

1.30pm

Video project report: Waitrose/John Lewis, Ipswich

This new joint-branded Waitrose/John Lewis At Home outlet is the first totally all-LED store for the company, and the first to have an installed load of under 10W/m². This special video report from Ipswich will be followed by a panel Q&A with the team behind the project, including Barry Ayling of John Lewis and Steve Haggis of Edge Lighting.

Session 3: Lighting and the customer

2.10pm

Dynamic lighting and control

Why are stores lit to the same level of illumination and same colour all day every day? Lighting controls can deliver dramatic savings in energy – and crucially provide a dynamic lighting experience that makes the merchandise the hero.



2.40pm

The psychology of retail lighting

How can lighting influence buying decisions? Dr

Katelijn Quartier of Hasselt University in Belgium outlines the results of the latest research into customer behaviour and how it is influenced by different retail lighting.

3.50pm

Retailer focus: Sainsbury's

In this special session, a senior executive from the energy team at Sainsbury's outlines the company's sustainability strategy and its implementation across the estate, including the key role of various lighting technologies.

4.20pm

Panel discussion: Overcoming the barriers to low-energy lighting

The panel includes Helen Drury of the British Council for Shopping Centres, Gary Heald of Projection Lighting, Simon Fisher of GE and the ex-M&S energy chief Mervyn Bowden.

4.50pm

Dragons' Den: The latest innovations in retail lighting



Four entrepreneurs pitch the most innovative retail lighting products of recent times in a special Dragons' Den-style presentation.

5.30pm

Networking drinks reception

There will be a networking drinks reception after the conference, sponsored by Projection Lighting.

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"Kosnic LED lamps are giving us the ambience and the performance we demand – all at a fair price," Dean Lavisher, Littlecote House Hotel.



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The Energy Bill concerns itself with supply, rather than demand

The Energy Bill: a missed opportunity?

Keith Wyatt asks if the government's efforts to promote renewable energy generation have seen energy-efficiency measures sidelined

Energy secretary Ed Davey has described the Energy Bill as 'the biggest transformation to Britain's electricity market since privatisation'. On first inspection this proposed watershed in the energy sector is timely for many organisations. As sustainability has gained political currency, plans to reward companies for cutting energy use are a welcome step forward.

The bill is designed to curtail the UK's dependence on fossil fuels, moving to a more diverse mix of energy sources such as wind, nuclear and biomass. The government believes this will fill a gap left by the planned closure of a number of coal and nuclear power stations over the next 20 years.

However, when it comes to reducing energy use, many will feel the path laid by the Energy Bill is limited. The efficiency elements of the proposals are not nearly as prominent as they could be, playing second fiddle to a focus on renewable power. Improving energy efficiency – by introducing financial incentives for businesses, improving access

to information, and incorporating reduced energy use into building standards – has been marginalised, appearing only in a consultation document. And although the government will potentially shield some energy-intensive industries from subsidising these developments, other businesses and consumers – who can ill-afford any increase in bills – will end up paying billions more for electricity to make up the shortfall. Government estimates show that these and other subsidies for low-carbon power will add £95 to household bills by 2020.

Industrial-scale potential

The potential for UK industry to reduce the amount of energy that it uses is massive. It is responsible for 55 per cent of the UK's emissions, and it is in business that the most effective savings can be made. It has been estimated that if industry made the simple switch from traditional factory lighting to energy-efficient lighting, Drax power station – the UK's single largest emitter of carbon dioxide)))



» – could be closed. Across the UK, innovative companies are developing products designed to improve energy efficiency. These range from sophisticated monitoring devices that provide a detailed breakdown of energy use, products such as low-energy lights that can cut bills by 80 per cent and motor controllers that monitor loads 100 times a second to calculate the exact amount of power required at each moment.


There are some common scenarios in which energy is wasted, and where the biggest savings are possible. For example, on average, a quarter of an organisation's electricity consumption is for lighting. And yet LED tube lighting typically saves 70 per cent or more of electricity costs with the added benefit of cutting maintenance.

Creating a working culture around electricity-saving initiatives is a good starting point for businesses that want to improve efficiency. At the

Even government buildings like BIS leave their lights on sometimes. We took this photo of fluorescent lights at windows in 2011

simplest level, regular staff meetings can help employees at all levels engage with the issue. Light switches should be clearly labelled to help employees use only those lights they need.

For businesses that want to go a step further and invest in energy-saving projects, engaging an expert to perform an audit to assess energy use – and where power is being wasted – is essential. This will make it easier to identify the technologies that represent the best investment, and ultimately make the whole exercise more successful.

With many businesses struggling to cope with rising fuel prices, the Energy Bill has brought the reduction of energy use to the fore. Although reducing the UK's dependence on fossil fuels is a noble aim, the process to achieve this must be re-evaluated. Continued emphasis on alternative and renewable energy has come at the expense of looking constructively at efficiency measures. As the climate change minister acknowledged: 'The cheapest form of energy is the energy that you don't use.' Which makes it all the more baffling that proposals related to reducing energy use have been relegated to a consultation document, rather than forming the main focus of the Energy Bill. 

● Keith Wyatt is honorary adviser on environmental issues to the UK Warehousing Association and commercial director of Premium Lighting Solutions.

'Businesses are responsible for 55 per cent of UK emissions, and it is in business that the most effective savings can be made'



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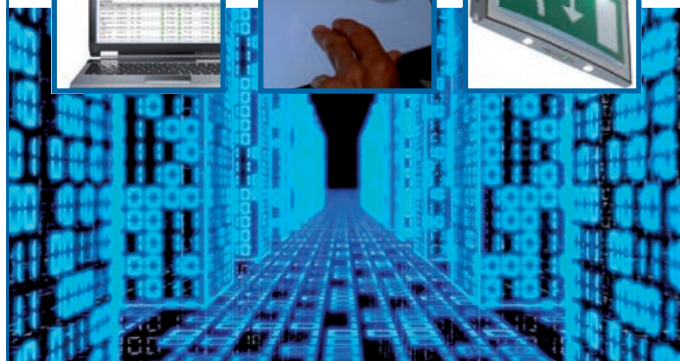
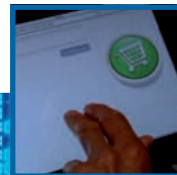
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Design clinic: boardrooms

Alan will see you in the boardroom now: Lux magazine's technical editor

Alan Tulla sets out three contrasting ways to light the top table




Boardrooms come in different architectural styles and, intentionally or not, reflect the image of the company. There is no 'standard' way to light a boardroom; we've chosen three completely different ways of doing it.

Design considerations

Our hypothetical boardroom is about 12m by 7.5m with a 3m-high ceiling. There's a full height bay window and a small lobby at the entrance. In the centre is a 6m-long oak boardroom table, and there is a lectern adjacent to the AV screen.

The EN 12464 workplace lighting standard and the SLL Code for Lighting do not make specific recommendations for boardrooms, so the ones for meeting rooms would be a good starting point. But remember boardrooms aren't just for meetings – there are quite often AV presentations during which the lights must be dimmed, or if you're using flip charts or whiteboards you might want to concentrate the light at one end of the room. Don't forget you will need good illumination on the table for taking notes, reading and maybe inspecting things such as products or printed materials.

All these requirements mean you should think about having several preset lighting scenes directed from a control plate on the wall.

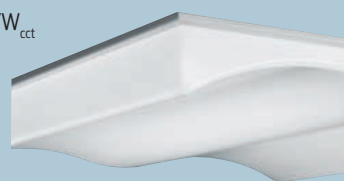
Note that these rooms tend to be less frequently occupied than conventional offices. A simple absence detector would be a cheap and simple way to minimise energy consumption. 

The economical option



TECH SPEC

Luminaire Lively 600 OT LED 3900 neutral white
Optical control High transmission, wave-shape opal acrylic diffuser
Arrangement Three pairs about 2m apart
Average illuminance at table level >500 lx
Luminaire efficacy 98 lm/W_{cct}
Electrical load 240W
Typical cost for six units £1,250
Pros Clean, neat, simple and economical
Cons Can give a rather flat appearance to the space



This is a simple, economical, efficient and unobtrusive scheme. The Trilux Lively is one of the latest generation high-efficiency LED luminaires – one of the few on the market that's a true rival to T5. We have arranged 600 x 600mm recessed LED units in three pairs above the centre of the table.

You can see that almost all the light from the luminaire is directed downwards in a broad beam with soft edges. The illumination on the table is around 500lx and there is plenty of spill light to

The table is well lit and spill light illuminates the surrounding areas

illuminate the surrounding areas.

This particular model has a wave-shaped diffuser that makes an interesting difference from a plain flat panel whether switched on or off. You can also adjust it up and down slightly to increase the spread of light onto the ceiling.

This layout has the advantage of making the table the centrepiece of the room. A disadvantage is that some of the furthest walls wouldn't receive much light. A row of spotlights would solve the problem.

The flair and flexibility option



TECH SPEC

Luminaires Neximo H2 suspended and Neximo S1 freestanding uplight

Optical control Direct/indirect

Arrangement N/A

Average illuminance at table level 350-550 lx

Luminaire efficacy 56 lm/W_{cct}

Electrical load 560W

Typical cost £4,750

Pros Modern attractive fittings, light, airy appearance to room. Lots of flexibility

Cons Initial capital cost



This is a much more modern-looking scheme with a high degree of flexibility. We have three extremely slim (28mm) linear LED units suspended over the table. More than two-thirds of the light is emitted upwards so the ceiling is much lighter and brighter than it is when using the recessed units in the previous scheme. However, we still achieve more than 450 lx over most of the table. Note that the rendering software exaggerates the contrast on the ceiling.



We have added two free-standing uplights from the same range. That the amount of light emitted up and down can be controlled individually by two small pushbuttons mounted in the body. Having the two uplights gives much more and adaptability to the scheme.

This space would be ideal for video conferencing. The award-winning product design of these luminaires gives a decidedly modern feel to the boardroom.

The 'make an impact' option



TECH SPEC

Luminaires ScenaticPoint 901 LS-FL LED 500 neutral white, small LED downlight

Optical control Various

Arrangement N/A

Average illuminance Over 500 lux on the table, 75-100 lx elsewhere

Luminaire efficacy Greater than 73 lm/W_{cct}

Electrical load 480W (approx 40 units, 12W each)

Typical cost £1,500

Pros Much the most striking looking

Cons Building the suspended raft



This is a completely different approach that I've designed to emphasise the contrast with the other schemes. Here we have a much more striking visual effect by using downlights around the walls and in a custom-built structure above the table.

There is plenty of horizontal illumination on the table. I have used a medium beam optic so that there is some vertical illumination. If you were designing for a real-life situation, I would recommend you add some general background lighting.

One way would be to recess some uplights (even simple fluorescent battens if they were hidden)

This dramatic scheme could not be mistaken for office space

in the top of the raft and direct the light upwards. The capital and running costs are surprisingly low, although twice as much as the first option.



LUX VERDICT The first option is simple – but you get loads of light per watt and per pound. The second is a flexible scheme that feels modern. The ceiling is well lit, and it feels light and airy. The final option adds contrast that sets it apart from normal office space. If you can't make up your mind, elements of the first and last options could be combined.

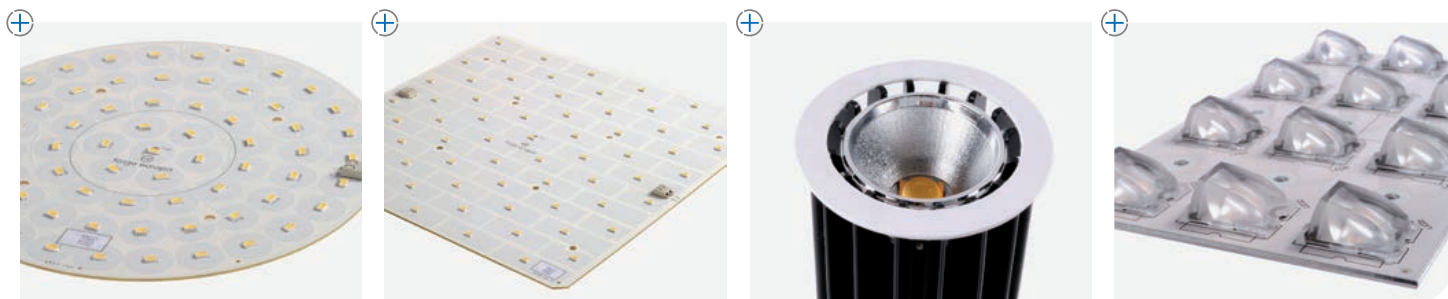
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Talk to:
Simon Cook
07880 382391

lumicom

The right time to buy LEDs?

Why wait to invest in LED sources when you could be enjoying the benefits now? Lux's lighting economist **Dave Tilley** does the sums

How many installations do you see with 50W halogen sources heating the space, scorching the ceiling and, more importantly, wasting energy?

It's easier than ever now to provide a return on investment within 12 months. So why is there such reluctance to embrace LED technology?

Funnily enough, the fact that the technology continues to get better and cheaper is one of the reasons clients are holding off. 'The price is coming down and the quality is improving, so I think I'll wait,' they say.

Wait or invest now?

But is there really an argument for waiting or are end users throwing away energy and maintenance savings? Let's look at some hypothetical examples. My assumptions about performance, quality and price are based on kit from the main UK LED manufacturers, and the examples are based on 4,000 annual operating hours and an energy cost of £0.10/kWh.

Let's go back a few years. A user has 50 50W halogens. A 3W replacement LED is proposed at a cost of £15.

THE PAST

| Lamps | Energy consumption |
|--------------------------|--------------------|
| Fifty 50W halogen | 10,000kWh |
| Fifty 3W LED | 600kWh |
| Saving | 9,400kWh |

The cost of the LED installation is £750 with an annual energy saving of £940 – a return on investment of 10 months.

But the issue a few years ago was not the reported energy savings of LEDs, but their performance and quality. Even when used in areas in which light levels were considered high, the 3W LED did more damage to the credibility of LEDs than it did to bolster the energy-efficiency credentials of the technology.

LEDs evolved and higher wattages started to provide reasonable lumen output – but at a price. So here's the same scenario with a 12W LED costing £20 a unit.



Retailers need to know if an LED retrofit scheme will make financial sense

THE RECENT PAST

| Lamps | Energy consumption |
|--------------------------|--------------------|
| Fifty 50W halogen | 10,000kWh |
| Fifty 12W LED | 2,400kWh |
| Saving | 7,600kWh |

The cost of the LEDs is now £1,000 with an annual energy saving of £760, so our return on investment has slipped from 12 months to 16 months. This means the user will need more convincing that life and lumen claims are genuine.

Now let's come into the present, where you can buy 6W LEDs for £10.

THE PRESENT

| Lamps | Energy consumption |
|--------------------------|--------------------|
| Fifty 50W halogen | 10,000kWh |
| Fifty 6W LED | 1,200kWh |
| Saving | 8,800kWh |

The up-front cost of the LED is now just £500, with an annual energy saving of £880 – a payback period of just eight months.

In these examples, I believe those that waited for the performance of LEDs to improve probably got it right. Early adopters may well have compromised their working environments with low light levels and poor uniformity.

)))



The venerable halogen lamp faces competition from LEDs

» Early adopters may well also find failure rates and lumen depreciation is higher than published. Unfortunately this has damaged the reputation of LED technology which, in turn, has slowed adoption. Is there an argument for early adoption?

What about the cost of maintenance? Take a 28-arm pendant with 25W incandescent sources at a mounting height of four metres.

| UPGRADING A 28-ARM PENDANT TO LED | |
|-----------------------------------|--------------------|
| Lamps | Energy consumption |
| 28 25W incandescent | 2,800kWh |
| 28 6W LED | 672kWh |
| Saving | 2,128kWh |

The LED cost is £420, with an annual energy saving of £212 – a payback period of 24 months.

So when we look at only energy costs, the ROI has extended – but the cost of maintenance will have a significant part to play in the calculation. If we estimate the cost of two electricians and perhaps a tower, the maintenance cost could range from £200-400 per visit. LEDs aren't invincible, there will always be some failures. But compared with an incandescent replacement regime, the cost will be minimal.

But what about the future? The key element to remember when considering LEDs is that performance and quality have a price.

A few simple questions must be asked when evaluating the benefits of LEDs.

- Do the stated wattage and lumen output appear correct? Check anything over 90lm/W because this ratio comes at a price.
- What is the power factor correction percentage? An LED system with a power factor correction of less than 90 per cent may well have other performance issues.
- What is the rated life at LM70? In other words, how long before the lamp output has declined to 70 per cent of its original light output?

- Have other performance criteria compromised the product's colour-rendering index?

Once the performance and quality have been established, the calculations are simple. The important ROI factors are maintenance and energy.


Replaceable or fixed?

Another consideration is whether to go for replaceable or fixed LED modules. The argument for replaceable LED modules is that you should soon be able to swap your current module with one with a reduced wattage or, if you want, improved lumen output.

The interesting aspect of this proposition is that the manufacturers that promote replacement LED modules have not provided comprehensive information about the cost of replacement modules. For example, would a 3W improvement be worth an investment of £20 in five years?

Thinking back to the early days of LEDs, a 3W improvement in energy efficiency requires a price that provides an acceptable ROI for the upgrade.

The missing ingredient is the life expectancy of LED sources. If, as would be expected, an LED operates for five years, the overall evolution and development of LED technology, including luminaire aesthetics, may well have completely changed.

It's great that we're taking sustainability into account, but do the manufacturers really know the impact of changing an LED module on a luminaire that may well have been operating for four or five years? Will the replacement module provide the claimed benefits? 



THE LIGHTING ECONOMIST'S VERDICT

Early adopters of LEDs will have saved themselves some energy, but they may well have been disappointed with the performance and quality of the LED sources.

Today there are ranges of LED lamps and luminaires that provide excellent value for money. The key issue, once again, is understanding the reasons for introducing LEDs as a lighting solution. Energy saving? Maintenance efficiency? Users really do have to do their homework on LED performance, quality and application.

I find it disappointing to see manufacturers offering LED lamps at reduced prices but with reduced performance – like GU10s that last 10,000 hours.

The aim is clearly to increase adoption of LEDs through the consumer channel – but the risk to the development of LEDs is that it will damage the user's perception of performance and quality.

You can contact Dave Tilley at dtalley@nrgstar.com

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What you CE is what you get

Dr Gareth Jones sets out the steps that lighting manufacturers must take to comply with European rules and use the CE mark



I am a manufacturer of LED lighting products and want to sell my products in Europe. What is required?

We touched on this question last month – now let's look at it a bit more closely.

For electrical products to be sold in Europe, the CE mark must be printed on the label before it goes on the market. Putting a CE mark on the product requires that the company provides a declaration of conformity stating compliance with the applicable directives laid down by the European Commission.

In general, for lighting products, the CE mark requires compliance with the following directives:

- **Low-Voltage Directive** (essential safety)
- **EMC directive** (electromagnetic compatibility)
- **Reduction of Hazardous Substances (RoHS) Directive**
- **Eco-Design Directive for Energy-related Products** (also known as the new CE Marking Directive)

Let's look at what the first two of these directives entail – we'll look at the others next month.

Low-Voltage Directive

The Low-Voltage Directive is one of the oldest directives of the single European market. It puts in place a conformity assessment procedure for electrical equipment before it is placed on the market and some essential health and safety requirements which equipment must meet.

The directive ensures that electrical equipment is safe and can be sold in the same way throughout the European Union. It covers electrical equipment with a voltage between 50 and 1000V for alternating current and between 75 and 1500V for direct current (it should be noted that these voltage ratings refer to the voltage of the electrical input or output, not to voltages that may appear inside the equipment.)

For electrical equipment within its scope, the Low-Voltage Directive covers all health and safety risks, thus ensuring that electrical equipment is safe for its intended use.

One important thing to note is that third-party assessment is not required for conformity with the Low-Voltage Directive. In other words, manufacturers can assess and declare conformity themselves.

ASK THE DOCTOR



Dr Gareth Jones is an experienced lighting and LED scientist with over 20 years' experience. His qualifications include a PhD in semiconductor physics and he runs the Lux-TSI test house, an accredited partner of UL.



The CE mark that must be placed on the labelling of products before they can be sold in the EU

However, it may be necessary to use a "notified body" test report in the event that any technical test information is challenged with regards to product conformity. This is where the test certificates issued by companies in the IEC's CB scheme (such as UL, BSI and Intertek), become very useful as they can remove any concerns about challenges to your technical testing data which is used for CE marking purposes.

The aim of the Low-Voltage Directive is to provide a harmonised European approach to the safety of electrical products in general use, to protect users. Harmonised standards are the means to ensure the harmonised approach is applied at a detailed technical level in the assessment of products via the same test methods and expected outcomes. The standards are those adopted within the EU by standardisation committees such as CEN and CENELEC.

A harmonised European standard will have the designation EN xxxxx, such as EN 60598 for luminaires. There are various extensions to this, such as EN 60598-1 for the general requirements and tests and then EN 60598-2-x which explore variations of application to particular luminaires (such as EN 60598-2-2 for recessed luminaires or EN 60598-2-22 for emergency lighting).

Many of them will have originated from the technical committees of the IEC standards committees and then receive some tweaks before emerging as a EN version. In most cases, the IEC and EN versions are very similar.

A list of all the harmonised standards which are applicable under the Low-Voltage Directive can be found online at bit.ly/lvd1301.

For LED-based lighting then some of these are

adoptions of IEC standards by CENELEC which then become EN standards.

| GENERAL SAFETY STANDARDS FOR LIGHTING PRODUCTS | |
|--|---------------------------|
| Type of product | IEC standard for safety |
| LED modules | EN 62031 (from IEC 62031) |
| LED control gear (drivers) | EN 61347 (from IEC 61347) |
| LED luminaires | EN 60598 (from IEC 60598) |

From February 2013 a new mandatory European requirement under the Low-Voltage Directive is being introduced for the assessment of lighting equipment related to human exposure to electromagnetic fields. The standard is EN 62493:2010. The requirement relates to ensuring that health aspects due to exposure to electromagnetic fields are considered and gives a method of declaring luminaire safety against the directive for this particular aspect. This requirement in conjunction with the need for measuring the photobiological safety of lamps, modules and luminaires using the EN 62471 standards are relatively new aspects for those involved in the manufacture and supply of lighting products to consider.

| NEW PHOTOBIOLOGICAL AND ELECTROMAGNETIC STANDARDS | |
|---|---------------------------|
| Type of product | IEC standard for safety |
| Photobiological safety of lamps and lamp systems | EN 62471 (from IEC 62471) |
| Assessment of lighting equipment related to human exposure to electromagnetic fields | EN 62493 (from IEC 62493) |

The technical aspects of interpretation of these types of standards is not easily performed and many companies producing products do not have the expertise either in terms of equipment of experience to perform such assessment and the manufacturer should be encouraged to seek advice from accredited testing laboratories with regards to assessment of products according to the relevant standards and directives before proceeding too far along the product development path. Re-engineering at a later date because of non-conformance can be a very costly exercise.

Electromagnetic Compatibility Directive

The Electromagnetic Compatibility Directive is important because all electric devices or installations influence each other when interconnected, or even just when they're close to each other. Sometimes you'll see interference between your TV set, your mobile phone, your radio and nearby washing machine or electrical power lines.

In the European Commission's words, the purpose of electromagnetic compatibility rules is to 'keep all those side effects under reasonable control'. It designates various techniques and technologies for

Lighting products sold in Europe need to have been tested for electrical, photobiological and electromagnetic safety



reducing interference by both limiting emissions and improving immunity to them.

Thus, we have the two key aspects of electromagnetic testing: emissions (ensuring products don't disturb other products) and immunity (ensuring products don't get disturbed by other products). Both are important.

| ELECTROMAGNETIC COMPATIBILITY STANDARDS | |
|--|-------------------------|
| Type of product | IEC standard for safety |
| Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment (the main emissions standard) | EN 55015 |
| Equipment for general lighting purposes – EMC immunity requirements | EN 61547 |

Doctor, doctor!
No need for an appointment – the doctor is always in. Send your technical queries to Dr Jones at thedoctor@luxmagazine.co.uk

Equipment needs to comply with the requirements of the Electromagnetic Compatibility Directive when it is placed on the market or taken into service, and good engineering practice is required for fixed installations. If organisations don't comply, authorities in each member state of the EU are able to step in.

For lighting products a number of key standards exist. A list of harmonised standards relating to the EMC directive for products is provided at bit.ly/emc130. 🇬🇧

● Next month, more on the Eco-Design Directive for Energy-related Products, also known as the new CE Marking Directive

The top lighting industry stories this month

PEOPLE

Director

Michael Grubb is leaving Sutton Vane Associates, design practice of the year in the Lux Awards 2012, after 15 years.



Former Sylvania president **Per Langholz** has been appointed non-executive chairman of the Nualight Group.

Krish Govinden is the new technical manager at the Lighting Industry Association Laboratories. He joins LIA Labs from UL STR, where he worked as a technician and in technical sales.



Natalie Redford is now associate designate at Light Bureau.

Mark Chivers has joined Gemma Lighting as sales office manager. He joins from Anglepoise Limited. The Wandsworth Group has named **Charlie Salter** as non-executive chairman.



Brian Norris, 1948-2012

Brian Norris, founder of the Lighting Workshop and former managing director of Courtney Pope Lighting, died on 9 December 2012. He had been ill for some time with scleroderma. Michael Dunk of Lucent Lighting, described Norris as 'a truly inspirational character' who will be 'sadly missed'.

Ex-Or shuts UK factory

Honeywell has closed the Ex-Or factory in Haydock, Merseyside.

Production of Ex-Or's range of lighting controls will now be split between a Honeywell plant in Germany and another at St Asaph in Denbighshire, Wales.

Graham Campbell, Honeywell's ACS business communication leader, said the Haydock site didn't have scope to expand in line with

the company's growth plans. He told *Lux*: 'This has nothing to do with the competency of the people at that site; it was so we could get closer to our customer base and be more competitive.'

'Each individual is being reviewed and potentially offered alternative employment across the Honeywell portfolio. We're hoping to move many of these to different roles

and locations.'

The Haydock factory had 30 permanent full-time staff and a number of temporary staff before the closure.

The St Asaph site will now be responsible for final assembly, logistics and tests, while the German factory will take on manufacturing. Campbell said Honeywell believes the move will help make the company more efficient.

PhotonStar share placing raises £1.57m to fuel new biodynamic lighting range



James McKenzie

LED lighting manufacturer PhotonStar has raised £1.57 million through a share placing with institutional investors.

The company says it will use the funds to finance the next stage of its growth and to launch a wireless biodynamic lighting product range based on its ChromaWhite colour-tuning technology, including

retrofit lamps.

CEO James McKenzie said: 'This additional funding will support our growth and enable us to develop more innovative and exciting products more quickly.'

PhotonStar's new shares, issued in December, represent about 12 per cent of the company's issued share capital.

Lumenpulse gets US patent for control tech

Lumenpulse has acquired a US patent for its Lumensmart technology, which allows LED luminaires to detect and adapt to the common lighting control protocols DMX, RDM, Dali and 0-10V over a wired network. Because it works with all four control protocols, Lumensmart saves designers and electrical engineers from having to specify the exact protocol used by a product.

Controls market to double by 2017

The market for lighting controls devices in commercial buildings will double from 2010 to 2017, says IMS Research. Shipments of devices are predicted to increase from 29.6 million to 61.6 million.

IMS analyst Philip Maddocks said: 'Reducing energy consumption to adhere to energy legislation is one of the main factors pushing forward the adoption

of lighting control systems in commercial buildings.'

IMS predicts Dali to become the most used control protocol, with shipments reaching more than 90 million devices between 2010 and 2017.

Wired control technologies are expected to continue to dominate, because of the number of firms offering them and the advantages they offer over wireless.

GE Lighting appoints new European boss

Agostino Renna has been named president and CEO of GE Lighting for Europe, the Middle East and Africa. He replaces Phil Marshall, who left the company recently, having led the division since 2008.

Renna will report to GE Lighting's president and CEO Maryrose Sylvester, who said: 'Agostino Renna's experience, leadership and significant sales and

marketing background make him an outstanding person to continue the transformation of the lighting business in the region.'

Renna, who is from Quebec, previously held the role of vice-president for growth and market strategy at GE Canada.

Before joining the company he spent 14 years at Johnson Controls, and holds a degree in mechanical engineering.



Agostino Renna

DW Windsor gets 3m integrating sphere



Streetlighting specialist DW Windsor has installed what is believed to be Europe's first 3m integrating sphere photometer at its factory in Hertfordshire.

The custom-designed Illumia sphere was supplied by lighting measurement equipment specialist Pro-Lite and made by US manufacturer Labsphere. It enables DW Windsor to accurately measure the colour and brightness of

even outdoor luminaires weighing up to 20kg. Alan Grant, DW Windsor's design and development director, said: 'Our Labsphere system is coated with a special high-reflectance paint so we can deliver accurate, repeatable results regardless of the size of the fitting, type of light source or shape of light beam produced.'

Regulations call for spheres to be at least 50 times larger than the product being tested.

Forge Europa's new lighting solutions centre in Cumbria is lit entirely by LEDs. The four-floor building includes office areas, meeting spaces, a kitchen and a lobby, featuring luminaires from iGuzzini and Cree, as well as Forge's own retrofit LED lamps. Managing director Peter Barton said: 'Forge Europa has been championing LED technology for over 20 years, and we wanted to rise to the challenge of a 100 per cent LED build.'



NEWS IN BRIEF

Harvard controls street signs

Drivers and controls specialist Harvard Engineering has teamed up with One2See Signs to supply controls for LED street signs to local authorities. Harvard's LeafNut wireless control system will be installed together with One2See's signs. The system has been successfully trialled by Westminster City Council, which already uses LeafNut for its streetlighting.

£430,000 for Lux-TSI

Photometric lab Lux-TSI has bagged £430,000 in investment to expand its facilities in Birmingham and Bridgend. The funding is a mix of loans and a £158,000 grant from the Welsh government.

Samsung tops patent table

Samsung has the most valuable patent portfolio in semiconductor manufacturing, according to the Institute of Electrical and Electronics Engineers' Spectrum magazine, with 4,977 US patents in 2011. SanDisk in the US and Semiconductor Energy Lab in Japan ranked second and third.

Bleak outlook for building

The construction industry is facing a bleak future, according to a survey of employers in the sector by ConstructionSkills. Having had a difficult five years and fallen back into recession last year, the prospects 'are for 10 more years of pain', ConstructionSkills said.

Reflektorlux scales up

Reflektorlux has moved to a new 15,000 sq ft building in Essex. The site houses the company's luminaire and reflector manufacturing facility and will also include a showroom and distribution centre.



Aurora LED lamp that mimics halogen

Aurora's LEDchroic lamps can easily be mistaken for conventional halogen, but have all the performance and energy-saving benefits of LEDs. The lamps have anti-glare LED lens technology with a micro lens array consisting of hundreds of lens facets that cause the jewel-like lens to redistribute the light from a single-source chip-on-board LED to achieve an evenly distributed beam with minimal glare. The lamps offer smooth, linear transition on most dimmers, and are guaranteed for three years.

www.auroralighting.com



Thorn extends popular Chalice LED range

Thorn has introduced a 3,000 lm version of its Chalice LED downlight, designed to replace a 2 x 32W compact fluorescent fitting. Operating at 32W with either fixed or dimmable gear, Chalice LED 3000 helps users halve their energy consumption. The recessed downlight has a consistent colour and a CRI of 80, in colour temperatures of 3000 and 4000K. The LED modules are expected to last 50,000 hours. With a similar cut-out diameter and light distribution to traditional fluorescent downlights, the Chalice range is suitable for refurbishments.

www.thornlighting.co.uk



LED floodlight from Kingfisher

Kingfisher Exterior Lighting's Aludra product is a high-specification, low-profile, die-cast LED floodlight. It is available in 20, 30 and 60W LED versions, as well as with 45 and 90W CosmoPolis lamps. Aludra's quick-release, tool-less catch cuts installation and maintenance time. It is sealed to an IP65 rating and has a ULOR of less than 10 per cent. Aludra has been used by Co-op at a distribution centre in Nottinghamshire.

www.kingfisherlighting.com



Dimmable LED downlight from Intalite UK

This dimmable and tiltable LED downlight comes in a square or round design and is suitable for indoor domestic applications. It draws just 8W of power and the trailing-edge dimming allows lower lighting levels when required. On full power, the Bridgelux COB LEDs produce 60 lm/W – at least as much as a standard 50W GU10 halogen lamp and compliant with Part L. The fitting is tiltable, so that it can be adjusted to reduce or eliminate glare. Manufactured in aluminium and with a matt white finish, these fittings are available with a natural or warm white light output.

www.intalite.co.uk



LED track lighting from OnLED

OnLED's LED track fittings are designed to replace halogen and metal halide systems found in standard track lighting systems. The fittings are integrated, with the light source, driver and fixing adapter built into a single, maintenance-free unit. This product has an extended life, high lumen output and optional finishes. It is ideal for use in retail premises, art galleries, museums and hotels, and fits into OnLED's extensive range of products.

www.selectronic.co.uk/onled



Kosnic's dimmable LED candle

The KTC dimmable LED candle from Kosnic emits light in 360 degrees, mimicking the effect of an incandescent lamp. LED lamps are now able to produce a CRI and lumen output closer to that of incandescent lamps. Critically, the use of advanced microcontroller technology means that this new generation of Kosnic lamps works seamlessly with existing dimmers. Consumers can take advantage of the benefits of LED lamps, while designers and installers no longer need to educate themselves on how individual products will interact with legacy dimming controls.

www.kosnic.com



LED pendant luminaire from Hacer

The latest LED technology lets Hacer's Glacia Eco Pendant achieve high efficiency. The Glacia delivers glare-free balanced illumination through the delicately ribbed opal acrylic refractor paired with Hacer's LED light engine. A standard 2m suspension with quick and easy chrome clutch adjustment and translucent power cable is supplied and a 5m suspension is also available. Glacia Eco Pendant is available with three high-efficacy lumen outputs, warm, neutral and cool white colour temperatures and a life expectancy in excess of 50,000 hours. It is suitable for architectural, retail and commercial projects.

www.hacer.co.uk



Pro-Lite's dual photopic/scotopic lux meter

Pro-Lite has launched the SL-3101 dual photopic/scotopic lux meter. Using two sensor heads that are precision-matched to the CIE photopic and scotopic observer functions, the SL-3101 photometer automatically reports both photopic and scotopic illuminance levels as well as the S:P ratio. The S:P ratio helps to quantify the improved performance at low light levels of those light sources with a strong blue content, in particular LEDs. The SL-3101 is suitable for site survey work and for use in the development of efficient streetlighting.

www.pro-lite.uk.com



Distinctive recessed downlighter from Hacer

Hacer's Ilano is a distinctive recessed downlighter offering a contemporary fusion of style and performance. The Ilano has a sculpted polycarbonate diffuser with a softer LED lighting ambience, a shallow recessing depth of only 45mm and optional inserts to add a distinctive and vibrant coloured edge to the luminaire. Technically, the Hacer-designed LED light engine has a choice of lumen outputs and colour temperatures, an outstanding LOR of 80 and a life expectancy of 50,000 hours. The Ilano has a built-in driver with optional Dali. Digital dimming and emergency versions are available.

www.hacer.co.uk



Single-channel high-power driver from Harvard

The latest addition to Harvard's CoolLED portfolio is this single-channel high-power switchable driver. It can deliver up to 150W with the option of either analogue, 1-10V or Dali dimming control. The driver is also WiMAC compatible, making it suitable for outdoor use because it can be used alongside the market-leading LeafNut control and monitoring system for street lighting. The single-channel switchable driver is the first in the CoolLED range of high power drivers, all of which are designed to be at the top end of the power scale.

www.harvardeng.com



Verbatim's latest OLED modules

Verbatim has launched colour-tunable and dimmable OLED modules that deliver glare-free brightness of up to 2,000cd/m², twice as bright as before. The company's latest series of Velve OLED modules use a red, yellow and blue system to form brighter and more precise white light rather than red, green and blue colour mixing. Verbatim's OLEDs can create atmospheric lighting in everyday architectural applications. Users benefit from harmonious soft light output, built-in calibration and an even distribution of light from panel to panel.

www.verbatim-europe.co.uk



LED retrofit 2D lamp from Goodlight

The Goodlight retrofit G-Sense LED lamp provides an unrivalled package of features including 65 per cent less energy consumption than a conventional 2D plus optional motion detection and emergency battery back up. The built in battery pack ensures continued bright light in the event of loss of mains power. Also, the lamp may be set to full brightness only when it detects movement, saving even more energy. Ultra-bright LEDs achieve full brightness instantly, with no flickering. G-Sense 2D LED lamps fit into existing 2D lamp fittings with no need for external control gear.

www.goodlight.co.uk

Upcoming events

Improve your lighting knowledge at an industry exhibition, course or seminar

12 February

The Future of Light Sources

Speakers at this event include Stewart Langdown and Peter Thorns.

Bishopsgate Institute, London

www.sll.org.uk

13 February

A927 Lighting & Energy Efficiency

This course looks at considerations for energy-efficient lighting. Cibse member rate is £318, non-member rate is £342.

Cibse, 222 Balham High Road, London

www.sll.org.uk

20 February

LIA Technical Forum

The LIA Technical Forum is open only to members. It aims to inform and encourage greater awareness of the technical issues everyone involved in lighting will face in the months ahead. To register your interest or request more information, contact christinab@thelia.org.uk.

www.thelia.org.uk

28 February

Retail Lighting and Energy conference



In this one-day conference you will gain competitive advantage by learning how to deliver first-class stores that work on every level. Experts and top names from the world of retail show you how to make dramatic reductions in energy use with the latest technology while increasing sales and improving brand perception. See page 76 for more details and the full programme.

Cavendish Conference Centre, London

www.retaillightingandenergy.com

5-6 March

LIA Certificate Course

Contact John Hugill at johnh@thelia.org.uk for more information on this four-day training course.

South Mimms, Hertfordshire

www.thelia.org.uk

19 March

Ready Steady Light 2013

Teams are given a range of equipment and compete to come up with an exterior lighting scheme in just three hours. Open for entries now.

Rose Bruford College, Sidcup

www.sll.org.uk

21 March

SLL Masterclass – Edinburgh

The SLL Masterclass series returns this year to keep you professionals up-to-date with lighting technology and applications.

Dynamic Earth, Edinburgh

www.sll.org.uk

12 April

Lighting Focus on Energy

The SLL and Cibse present this international conference on lighting in Dublin. A panel of world-renowned experts is currently being assembled to cover everything from legislation through to codes of practice, quality, new product developments and LED technology. The common thread throughout will be energy use and efficiency in lighting. Contact kevin.kelly@dit.ie for bookings.

Croke Park, Dublin

www.cibseireland.org

14-16 May

The LIA Advanced Certificate for Indoor Lighting

Contact John Hugill at johnh@thelia.org.uk for more information on this training course.

South Mimms, Hertfordshire

www.thelia.org.uk



The Retail Lighting and Energy conference gives you an opportunity to hear from top names in the business

23 May

(Rescheduled from 21 May)

LIA Annual Seminar and Lunch

This event is open only to members and their guests. For details contact charliem@thelia.org.uk.

www.thelia.org.uk

5-6 June

The Future of Lighting Fixture Design conference



We're bringing together in London the world's top experts in solid state technology, optics, thermals, drivers, standards and testing. Aimed at manufacturers, suppliers and specifiers, this vital two-day event gives insights that will drive your business forward and ensure you stay at the forefront of the lighting revolution. The format includes exclusive presentations by keynote speakers, interactive sessions, live interviews, panel discussions, *Dragon's Den*-style product demonstrations, networking streams and a drinks reception.

Cavendish Conference Centre, London

www.lightingfixturedesign.com

Oh go on, just one more

This month's Named and Shamed offers some cautionary tales on the dangers of excess in retail lighting. Remember, the first step is admitting you have a problem...



Lux hates to rain on the luminaire manufacturers' parade, but sometimes there comes a point when you have to say that your client doesn't need any more lights.

We were baffled by this installation in the Kurt Geiger store at Dublin Airport. What exactly possessed them to put in quite so many luminaires? Did somebody accidentally type an extra 'O' when they placed the order?

There look to be something like 80 spotlights on that ceiling. We dread to think what that means for Kurt Geiger's energy bill, and in our humble opinion it's not even achieving a great result. The ceiling looks like a field of upside-down metal sunflowers, when with a little more thought (recessed fittings? cove lighting?) and a bit of restraint, it could have had clean, unobtrusive lines, or made space for some other design feature.

Perhaps we're way behind the fashion curve, but the trend we see is for retailers exploiting the flexibility and energy efficiency offered by new lighting technologies – not making their stores look like luminaire manufacturers' showrooms.

FOUR MORE WHO COULD HAVE USED LESS



How many is too many?

We're not sure where to begin with this Omega installation in the West End of London. There's no need for all 20-odd of these lights even at night-time, and certainly not in the middle of the afternoon. Perhaps someone owed the manufacturer a favour.



Is that enough yet?

This otherworldly installation was spotted by reader Bradley Wherry at a clothes shop in East London. Considering the number of lamps (about 500 are visible in the photo at our count), we're struggling to understand how there's so little light on the merchandise.



Say when...

We count more than 100 MR16 downlights at this branch of Monsoon in Wimbledon. That's a lot of watts and a lot of heat. Looks like polka dot must be this season's style – at least for ceilings.



Too much?

Shoe shops seem to find restraint particularly difficult when it comes to lighting, and this branch of Office on Oxford Street is no exception. The light fittings almost outnumber the shoes.

Grass them up Tell us who we should name and shame next month at shamed@luxmagazine.co.uk

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TOOLSTATION

Brighten up with Toolstation's new LED lighting

Toolstation has launched its latest Catalogue with a whole range of new LED lighting products to brighten up winter.

LED lamps provide much longer life and energy saving and Toolstation has launched a new selection of LED torches, site lights, brick lights, emergency lights and downlights.

With ceiling downlights in high demand, Toolstation now has a 9 watt 520 lumens dimmable, fire rated, IP65 downlighter with 40,000 hours life and innovative anti-glare reflector for only £32.48.

There is also a stonking £40 saving on a top brand Makita 18V combi drill, now priced at only £149.98.

Pick up Catalogue 48 from one of Toolstation's 120 plus sales counters across the UK; order on 0808 100 7211 or at www.toolstation.com



LUMAERA™

Introducing the new LUMAERA Gen 2

- 50mm tuned blue light engine for use with remote phosphor technology offers unrivalled colour consistency and efficiency
- "Twist and Lock"changeable colour temperature from 2700k to 6000k
- Compatible with industry standard holders offering "Twist and Lock"reflectors in various sizes
- 22mm, 45mm and 61mm LES (Light Emitting Surface) producing between 400 and 4000 lumens of useable light
- Compatible with standard driver currents 350mA, 500mA, 700mA
- Compatible with remote phosphor 3D shapes in ellipse, candle and dome formats
- RGB and RGBW COB formats also available.

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Lighting jargon explained

People who work in lighting don't half talk some gobbledygook. Here's what they mean

Colour temperature

Colour temperature describes whether a light source appears 'warm' or 'cool' – indicated by the correlated colour temperature (CCT). Lamps with a warm appearance have a CCT of 2700-3000K, and are considered appropriate for domestic settings; cooler lamps might be 4000K, and are used more often in offices and retail. The higher the colour temperature, the 'cooler' the appearance. Don't ask.

CFL

Popularly referred to as energy-saving lamps, compact fluorescent lamps have a poor image because of perceived deficiencies in colour, power and speed to full output. But massive improvements have been made in all these areas thanks to substantial investment by the big lamp manufacturers.

CRI

Short for colour-rendering index, CRI is the ability of a light source to show the colours of objects as they should be. Lamps with poor colour rendering will distort some colours. It's on a scale between 0 and 100; the higher the number, the better the colour rendering. CRI only works for approximately white sources, and it's a bit of a blunt instrument because it doesn't tell you which colours a light source renders well or badly – it just gives you a single overall figure. In the UK, guidance in the CIBSE Code recommends lamps with a CRI of over 80 where accurate colour judgement is required – in shops or offices. For inspection and colour matching, a CRI of above 90 is recommended. Researchers at NIST in the US have suggested that the colour-rendering index is less suitable for LED spectra, especially the way saturated colours such as red and yellow are dealt with. They have proposed an alternative colour quality scale (CQS).

Dali

The Digital Addressable Lighting Interface is a protocol for lighting controls and dimming agreed by major manufacturers. It is set out in the technical standard IEC 62386. The AG-Dali is a working group set up by the manufacturers and institutions to promote Dali technology and applications.

IP rating

An IP (index of protection) rating tells you the level of protection that a luminaire or other piece of equipment provides against things getting in – including dust, dirt and water as well as hands and fingers. For example, a fitting

rated IP22 is protected against insertion of fingers and will not be damaged by exposure to dripping water.

kWh

The kilowatt-hour is a unit of energy equal to 1,000 watt-hours. That's what a 1,000W device uses in one hour – or what a 1W device uses in 1,000 hours. It's the unit that your electricity bill is counted in.

Lux

Lux is the international unit of illuminance – a measure of how much luminous flux (in lumens) is spread over a given area (in square metres). In other words, it tells you how much light is arriving at a surface. 1 lm/m² equals 1 lx.

Multiply an illuminance figure in lux by an amount of time in hours and you have a measure of exposure in lux hours – useful if you're looking after delicate objects or surfaces that can't be exposed to too much light.

SON

High-pressure sodium lamps (commonly known as SON lamps) are gas discharge lamps that use sodium in an excited state to produce light, and are often used for streetlighting. SONs produce a yellow light and have poor colour rendering. But they are efficient, often reaching about 100lm/W. Higher-powered 600W versions can reach an efficacy of 150lm/W.

Zhaga

Zhaga (not an acronym) is an industry-wide co-operation to standardise specifications for the interfaces of LED light engines. The aim is to enable interchangeability between products made by diverse manufacturers by defining interfaces for a variety of application-specific light engines. Currently, all Zhaga members are manufacturers.

W_{ctt}

This is the unit for circuit watts – the number of watts used to power an entire circuit. This differs from the usual watt, which refers to watts per luminaire.

ZigBee

ZigBee is a global specification for digital radio communication that is suitable for applications that require a low data rate, long battery life and secure networks. Among those applications is lighting control. No special devices are needed to connect equipment to the lighting network. ZigBee is simpler and cheaper to implement than other wireless networks, such as Bluetooth.

Lighting Specification Sales Manager

Gewiss Group is a European manufacturer of electrical products, ranging from installation & cable accessories, enclosures, circuit protection, lighting and much more. Following the success of our lighting catalogue across International markets we are now introducing our lighting products to the UK market.

Gewiss UK Ltd is seeking a talented, professional lighting sales person with the skills and ambition to launch our high quality and innovative lighting range, including street lighting, floodlighting, architectural and feature lighting, into the UK specification market.

The ideal candidate will have a proven track record of lighting specification sales, with a strong portfolio of lighting contacts both in the public and private sectors.

This represents a strategic position, which will impact directly on the future growth of our Company. The role is both exciting and challenging, and will provide the opportunity to directly impact and achieve recognition for the successful UK launch of our extensive range of lighting products.

This position reports directly into the General Manager, and will enjoy the full support of a professional, dedicated team based in Cambourne, Cambridgeshire.



GEWISS

Interested candidates should contact
gewiss@gewiss.co.uk
 with your CV and covering letter.

acdc

Bringing light to life

UK Head of Sales ■ South East or London Based

acdc is not just another lighting manufacturer. We're an independently owned, dynamic business proud to do things differently, to break the mould, to seek out new innovative process and practices.

For more than a decade we've been delivering **ground breaking new products** which have been **revolutionising the lighting industry**. We are **passionate** about architectural LED lighting and have been fortunate enough to work on some of the most prestigious projects in the world.

We **deliver on our promises** with the same level of commitment, regardless of a projects' size or scale. We offer a portfolio of outstanding LED products and truly believe we are leading the way in architectural LED lighting solutions.

- Reporting to the board and part of the UK senior management team
- Leadership, development and recruitment of sales professionals and teams
- Responsibility for achieving company sales targets, profit and top-line growth
- Develop and evolve sales strategy in line with financial and strategic objectives
- Business development within existing client portfolio as well as emerging markets
- A background working within London
- Ideally graduate-level or equivalent, technically competent and commercially astute
- A proven track-record of leading and developing sales people and teams
- A solutions-focused mentality and experience working with specifiers and end users
- Developed influencing skills, emotionally intelligent and with a high-integrity approach
- Excellent package, benefits and personal developmental opportunities

Please apply to the retained agents: Ben Freeman or Grant King - Corrigan Bentley Executive

● executive@corriganbentley.co.uk ● 01293 608708 ● www.corriganbentley.co.uk

Corrigan Bentley
 RECRUITMENT SOLUTIONS

LED Area Sales Manager – UK, Midlands based

£30,000 - £40,000 basic + Company Car + generous commission scheme

This £70million Company is a leading designer and manufacturer of LED lighting technology with prestigious blue chip clients around the world. You will be selling their range of energy efficient LED products to corporate clients, specifiers utilising your sales/product knowledge and lighting design skills. Excellent career move for a sales professional with design skills seeking to work in an autonomous function outside of a corporate structure.

Project Sales Engineers - Architectural/ Commercial Lighting Products

Basic salary from £28,000 - £35,000 + excellent commission scheme + Company car + benefits

Fantastic new opportunity to become an integral part of a leading comm/arch lighting solutions provider. You will be selling a quality range of technically innovative lighting products (interior and exterior) to the top end lighting designers, interior designers, architects, consulting engineers and corporate clients. By offering a complete product portfolio combined with sophisticated function, technology, style and design your success is virtually assured. This opportunity will be ideal for an experienced lighting professional with a proven track record in selling on technical performance and quality issues. Vacancies 1. Bristol/ South West 2. SW London 3. Manchester/Nth West

Design Manager, Sales Account Manager, Project Manager – Based in Dubai

Exciting new roles have become available with this well established lighting Company in UAE.

You will be selling a quality range of UK manufactured LED lighting solutions to the retrofit market sector including hotels, large retailers, logistic, transport and warehousing Companies throughout the region. The ideal salesperson should have a good understanding of lamps and fittings, able to sell on values and benefits, cost savings and ROI. The sales process can be very conceptual and so you will need to understand individuals' business values in order to sell effectively. A hands on project manager is also required to assist in the smooth running of the project life cycle including co-ordinating logistics, transition, installation and commissioning. The ideal candidates will have a good lighting/electrical background, understand end user sales and are actively looking to start a career and new lifestyle in Dubai

Specification Sales Professional (leading Manufacturer)

£30,000 - £38,000 basic + commission scheme + Company car + benefits.

A brand new opportunity to become part of this expanding lighting Company selling high quality lighting equipment at the forefront of LED technology including interior commercial and exterior applications. You will be selling into the specification market sector throughout Oxfordshire, Bucks, Berks and North West London targeting architects, local authorities, consultants, M&E consultants within transport, rail, logistics, food processing, and pharmaceutical end users. Concentrating on nominated key accounts and actively seeking new business opportunities you will be able to sell using your enthusiastic, creative solutions sales experience to build relationships and develop turnover.

Specification Sales Professional

£35,000 - £45,000 basic + commission to £10,000 + fully expensed car + benefits package.

Our client is a well-established manufacturer of exterior lighting with applications varying from road and tunnel, sports stadia, bridges, monuments to parks and public squares. You will be selling cost effective LED luminaires to local authorities, contractors, consultants and specifiers throughout the Midlands. You should be a professional lighting salesperson with a proven track record of working with local authorities and consultants within the sales region.

Purchasing & Product Manager

£35,000 - £42,000 basic + bonus + benefits

Brand new opportunity to work for this well established International, £multi-million organisation with existing infrastructure and established customer support, technical department and logistics network. With the recent launch of a new LED lighting division they are now seeking an experienced purchasing and product manager. Responsibilities will include managing the stock levels and availability of various product lines ensuring best commercial terms are met. You will also be responsible for competitor analysis and updating the Company on emerging trends and technologies in the marketplace. The ideal candidate will have a wide knowledge of the lighting industry, experienced in purchasing with front end commercial nous.

Project Sales Manager

£38,000 - £45,000 basic + car allowance + commission

This exciting Lighting Manufacturer is now looking to recruit an experienced lighting sales professional to help them develop their company in existing and new markets.

With an extensive range of products continually being developed and launched you will have access to leading innovating LED designs. You are likely to have several years' experience at a senior level in lighting sales and be able to make use of your close personal contacts to bring quick results. Experience in the specification channels encompassing Lighting Designers, M&E Cons, Architects, & Interior designer groups and retail end users would be a distinct advantage.

Project Sales Manager – exterior architectural

£30,000 - £38,000 basic + Commission + Company car + benefits

This well-established manufacturer is seeking a dynamic, enthusiastic lighting sales professional to sell to architects, designers and M&E consultants throughout London & South East selling a comprehensive range of LED solutions, although majority for exterior applications including bridges, parks, corporate headquarters, hotels, landscapes and structures. The ideal candidate should be an experienced project based salesperson with credibility and passion for this sector.

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Consultants

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LIGHTING DESIGN INTERNATIONAL

This is a rare opportunity for ambitious lighting designers to join our successful and creative design studio in London to work on a wide range of prestigious projects all over the world.

SENIOR LIGHTING DESIGNER

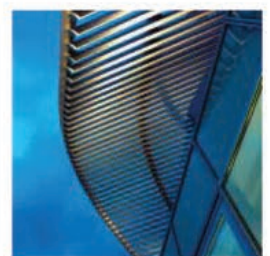
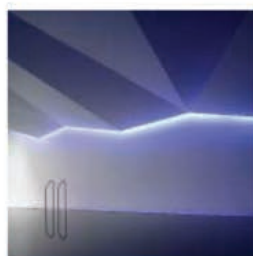
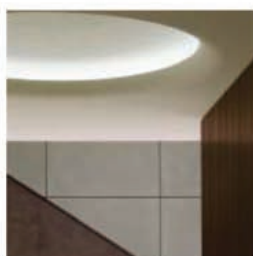
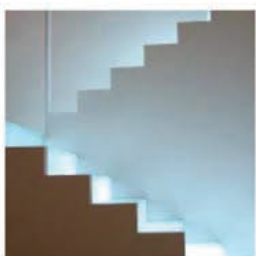
Ideal candidates will have at least five years' relevant experience with an independent lighting design consultancy and will have excellent design, project management and presentations skills. Experience of high-end residential and five star hotels would be ideal.

LIGHTING DESIGNER

Ideal candidates will have at least two years' relevant experience working in lighting design. A lighting qualification would be preferred along with fluency in Autocad and Photoshop. Must be motivated, enthusiastic and thrive under pressure.

To apply, send your CV along with a portfolio of your work to recruitment@ldi-uk.com.

www.lightingdesigninternational.com



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LED Specification Sales £40-45k Basic Plus OTE + Car + Benefits **Job Ref ID 258**

Technical Manager £50-55k Basic Plus High OTE + Car choice + benefits **Job Ref ID 263**

Strategic Account Manager (Wolseley) £45k+ Neg Salary + Major Co. Benefits + Car choice **Job Ref ID 261**

Area Sales Manager £34-38k Basic Plus High OTE (Open Ended Commission) + Car + Benefits **Job Ref ID 259**

Field Sales Executive £28-35k Basic Plus High OTE + Car **Job Ref ID 254**

Project Sales Manager (London Region) £38-45k Basic Plus High OTE + Car / Allowance **Job Ref ID 244**

www.maddisonconsultants.co.uk

Tel: +44 (0) 1252 781777

Email: sales@maddisonconsultants.co.uk



We currently have an opening for a Regional Sales Manager, UK and Nordic Region within our Cree LED Lighting group. This position will be based in UK.

Summary:

The primary focus of this position is the development and management of the Cree Lighting revenue stream to assigned region. The position will also hold key relationships and function as the primary contact for the customer and agent relationship of the region. This position will be responsible for driving revenue through business planning and customer/end user development, but will also require close collaboration with sales management, marketing, product development, market development and customer service, while maintaining a relationship with engineering and applications personnel.

Responsibilities:

- Responsible for selling the company's Lighting products, developing new accounts and expanding existing accounts.
- The position will also hold key relationships and function as the primary contact for Cree Lighting's customers in the assigned region
- Must be self-motivate and able to independently manage various activities with minimal supervision.
- Establish strong business relationships with distributors and key customers
- Effectively communicate/present the Cree Lighting Value Proposition and leverage it to create a competitive advantage
- Manage distributors and representatives to ensure sales objectives are achieved. This will include continually evaluating effectiveness/performance relative to market potential
- Provide competitive market information to management to help drive the direction of product marketing and development
- Propose new product opportunities to business development teams based on customer needs, timing, and compliance with Cree Lighting core competencies, competitive intensity and general segment attractiveness
- Support local and national trade shows as needed
- Understand the level of customer satisfaction with Cree technical support and drive continuous improvement in customer satisfaction while meeting Cree's business needs
- Work with other managers and marketing personnel across the Lighting business unit to continuously upgrade the customer solutions process
- Maintain a new business pipeline and relentlessly pursue opportunities to broaden our markets
- Meet and exceed Cree Lighting revenue targets

Performance Metrics:

- Meets or exceeds sales quotas consistently
- Maintains detailed customer records on an on-going basis, and provides additional written details on important customer developments or feedback by request. This includes providing weekly updates on sales-to-quota and market activities.
- Participates professionally and freely with Cree Lighting senior management on the business development and planning process. Available to participate in key planning discussions.

Behavioral Characteristics:

- Excellent presentation and written communications skills
- Demonstrated active listening skills
- Strong negotiating skills
- Strong problem solving and conflict management skills
- Ability to gain trust and respect from customers' managerial and sales teams
- Self-motivator with strong drive to achieve business objectives
- Sound technical aptitude
- Driver licence
- Personal availability to intense travelling

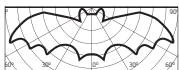
Requirements:

- College degree required or equivalent business experience
- 5-8 years general experience in the lighting industry, with a minimum of 3 years experience working with specifiers, contractors, and distributors
- Computer skills – Outlook, Excel, Power Point and Internet Research
- Excellent command of English language (verbal and written)

Preferences:

- 5+ years of management experience (sales and/or key accounts) in the lighting industry
- Demonstrated history of key account sales/business development success
- Knowledge of marketing strategies and tactics, basic market research techniques, product demonstration and sales techniques
- Business or marketing degree preferred

To apply, please send your CV to: Sara Petrucci at info.europe@cree.com



Contact the bat at
thebelfry@lux
magazine.co.uk



HOW MANY CATS DOES IT TAKE TO CHANGE A LIGHT BULB?

It was surely only a matter of time before the internet produced a photograph of a cat changing a light bulb. And here it is. Cats don't usually lower themselves to carrying out domestic chores, but we're glad that this moggy made an exception – and it proves conclusively that it takes only one cat to do it. Having said that, the operation looks a little hazardous for all involved, so we hope the cat and its owner got the job done without injury.



HIGH ON LIGHT

Dozens of Porsche drivers in Amsterdam have had their xenon headlights stolen, apparently by cannabis growers looking for the perfect light source to cultivate their crops. *The Guardian* reports that 35 sets of headlights have been reported stolen from Porsche Cayenne and Panamera models in the city in recent months. The lights apparently give the optimum light-to-heat ratio and can be removed by a thief in less than a minute. Whether they comply with Dutch building regulations, we're not so sure.



HERE'S ANOTHER NICE MESS YOU'VE GOTTEN US INTO



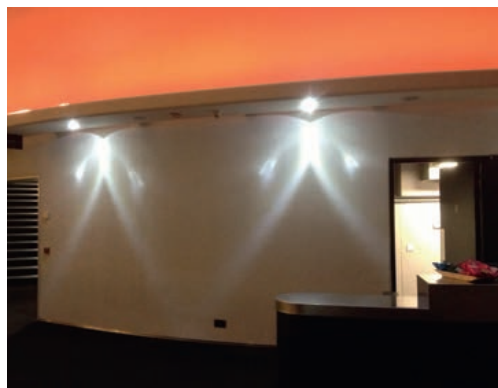
This Christmastime, Team Lux sent some rather nice little light bulb-shaped vases to a few lucky friends and family. We received this photo back from Forge Europa in thanks for theirs, which shows the little bulbs in the hands of Laurel and Hardy, or rather the statue of Laurel and Hardy in Forge's hometown of Ulverston. Fans of Laurel and Hardy's *oeuvre* will no doubt recognise this as a reference to the duo's 1935 film *Tit for Tat* which involves some hilarious light bulb-related antics as the pair attempt to install an illuminated sign outside their electrical supply shop.

TRY AGAIN, VINCENT

The news this month that LEDs were gradually turning Van Gogh's *Sunflowers* brown (page 6) is bound to cause a bit of a kerfuffle. LEDs have been hailed as a technology that can enhance and protect artwork, thanks to their low UV content. Defenders may say that the latest concerns relate only to a particular type of yellow paint used in the late 19th century, but who wants to be the first to stand up and accuse Vincent van Gogh of using the wrong colour?

MARS ATTACKS

Batwing spotted this ghostly lighting effect at the Sage music centre in Gateshead. Either they've done something clever with some shades and reflectors, or the northeast of England is under attack from aliens made of light. Oh well, if it is an alien invasion, our money's on the Geordies. These light people may be super-advanced space beings with photons for fingers, but can they make it through the February evenings in Newcastle without a coat?



GLS LAMPS WRESTED FROM COLD, DEAD HANDS

Republicans in the US state of Texas have quietly given up on attempts to overturn federal energy-efficiency standards that discouraged the use of incandescent lamps, according to a blogger in the *Dallas Observer*.

Right-wing politicians in the state considered the standards an assault on every American's right to guzzle as much energy as they want to light their homes. The fly in the ointment for them, however, was that, to sidestep the federal rules, a company would have to set up in Texas to manufacture and sell the lamps. They now seem to have accepted the reality that such a plan didn't make much business sense.

Representative George Lavender of Texarkana expressed disappointment that no company had come forward. 'We haven't found anyone willing to put in a plant and make them,' he told the *Austin American-Statesman*.

When even the state of Texas accepts that the battle to save the GLS lamp is lost, there is hope for us all.





Bringing **RETAIL** light to life



acdc **RETAIL** – open for business

For details on our latest LED product releases specifically designed for retail applications, visit acdcighting.co.uk/retail-2012

acdc[®]
Bringing light to life

GE
Lighting



Lumination™ LED Luminaires
1200 mm, 1800 mm **Linear Suspended**

Discreet. Dramatic.

GE LED Luminaires

GE Lumination™ LED Luminaires are featuring edgelit technology. When illuminated, the panels deliver broad uniform light and while off they appear completely free of a visible light source.

www.gelighting.com



Lumination™ LED Luminaires
1200×300 mm **Suspended**



Lumination™ LED Luminaires
1200×300 mm **Recessed**



Lumination™ LED Luminaires
600×600 mm **Recessed**



GE imagination at work