

The Evolution of LEDs



Above and Below: Hospitality LED Lighting by Chelsom.

A1 takes a look at how LEDs have evolved over the years and why they are now the lighting of choice for many businesses and homes alike.

The journey of LEDs from conception through to the present day.

The earliest LEDs emitted low-intensity infrared light and were often used as indicator lamps for electronic devices, replacing small incandescent bulbs. They were soon packaged into digital clocks in the form of segment displays. These days their use is far wider and you can see LEDs in many different forms; from spotlights to strip lights and light panels to exterior lights.

Robert Chelsom, MD, Chelsom comments "It took a long time to create LED which gave out warm white light. Reds, greens and blues were followed by a cold blueish white light but as long as the manufacturing source is good quality, acceptable warm white colours are now available. Good quality manufacturing also means a consistency of colour temperature because with some cheap sources of supply almost every lamp gives

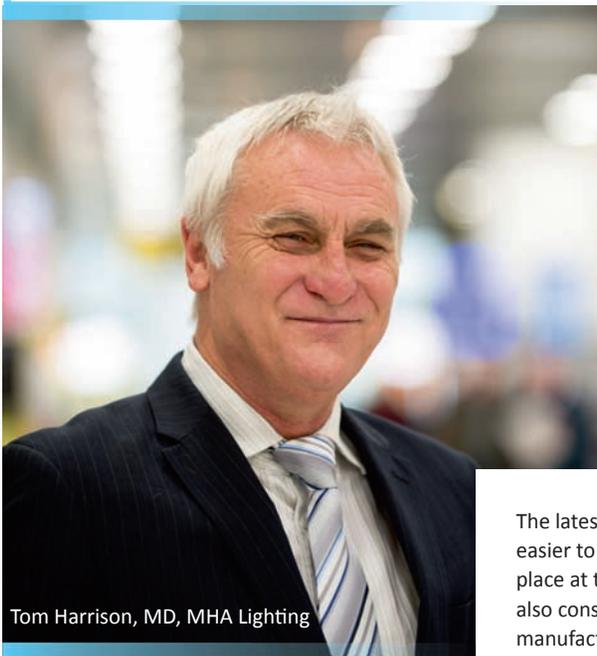
out a slightly different colour shade. LED light is linear and has therefore been perfect for display and navigational lighting as well as back lighting and task lights. Making LED light shine through 360° (to replicate the light patterns of the old incandescent lamps) has been more of a challenge. Manufacturers continue to invent new ways to try and make that happen but so far there will always be one blank spot in the 360° circle."

Issues with LED and how they have been overcome.

There have been many issues with LEDs over the years, however many of these have now been erased through technological advances. Issues have included CRI, K, nominal-hot-delivered lumen, warranties, LM80, R values, dimming, warm-dimming, white tuneable and wi-fi control.

Tom Harrison, MD, MHA Lighting comments "But don't be put off – a good LED solution in almost all instances will outperform others. The energy efficiency benefits of LED lighting are proved and accepted, so at MHA we are constantly investing in design and innovation that will improve the illuminance of the product, provide consistent colour temperature and achieving high quality CRI. These factors, combined with good light distribution, high quality uniformity and high luminous intensity of the LED light means we can create extremely bespoke lighting schemes for our clients.





Tom Harrison, MD, MHA Lighting

LED Lighting by MHA Lighting.



The latest dimming technology is making it easier to put the right light in the right place at the right time. Driver technology is also constantly improving and capable LED manufacturers are developing new dimming solutions that allow LEDs to dim right down to 0 per cent without flicker. In fact, most lighting designers and buyers are now designing their schemes around LEDs not just because of low energy consumption but because of their functional flexibility."

Cost vs Quality

The LED market has seen an influx of products with some failing to meet the high specifications that other products adhere to. As a rule, with most items, you get what you pay for and a cheaper product may give inferior results.

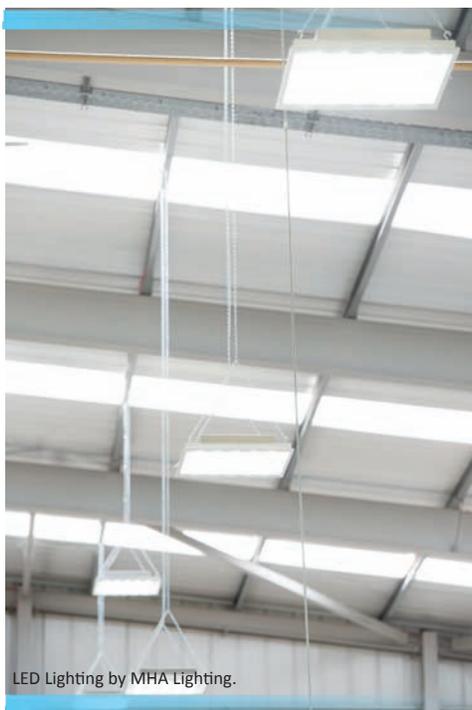
Adrian Kitching from MEGAMAN comments "This over capacity causes a huge pressure on downward cost prices and fierce competition that believes all it has to do is drop the price each quarter to grow sales. No one is really thinking about the customer and what he wants. I was recently at the b,a,g, factory seeing LED drivers being made and thoroughly tested. SMT machines were adding some 350 components on to two sides of a PCB board – just to make a humble high quality LED Driver. The next time you pick one up try to think what's inside it because I can also tell you I have seen some with only 50 items as well. All that glitters is not gold and unfortunately the industry is not regulated or policed sufficiently enough to stop these rogue traders selling inferior products openly. We all need to work together better via the LIA, Trading Standards and HM Customs to have a robust system, let's look to Germany as an example, their local county infrastructure will not let poor product be installed as the way electrical contractors work is fundamentally different to the UK. Perhaps we can learn from our EU friends."

Uptake in usage particularly in industrial, hospitality and business sectors.

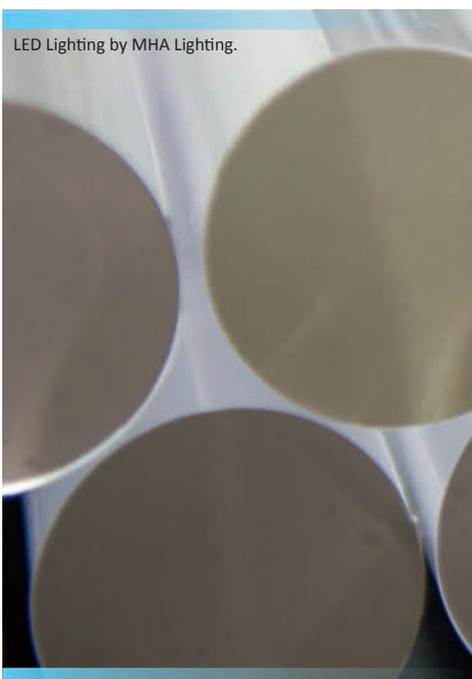
LEDs have recently seen a large increase in usage, especially in businesses. Electricity is a large overhead for any organisation and

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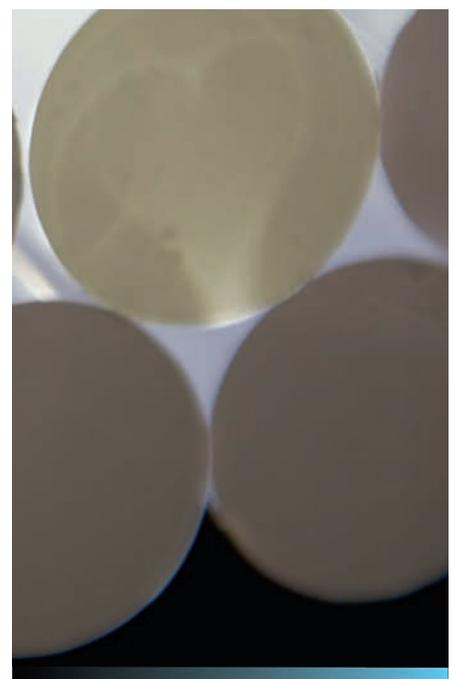
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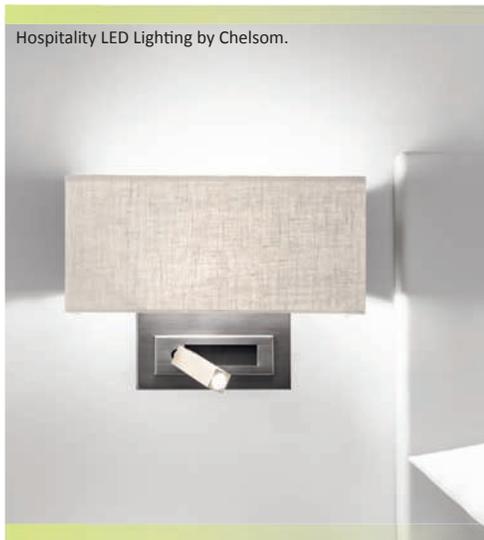
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Hospitality LED Lighting by Chelsom.



lighting makes up a high percentage of this. When specifying lighting for any project it is important the lighting designer understands the needs of the organisation and the goals the lighting system is set to achieve.

Roberto Martello, Design Director, Reggiani Ltd Lighting comments "Of paramount importance are the good services of a competent lighting designer or consultant who understands the complexity of modern lighting systems and is completely au fait with the constantly-evolving technologies behind today's light sources and knows how best to employ them. The designer will select the best quality products for every project and will pinpoint exactly where and how to install them to take maximum advantage of their in-built reliability, flexibility, efficacy and energy efficiency. Given the requisite design freedom, the lighting designer will incorporate as a matter of course the full range of benefits for which LEDs are already well-known and will also include where possible important recent developments, such as wireless control solutions and miniaturisation. Wireless control solutions significantly lower wastage by linking the level of light output to daylight and occupancy detection, hence reducing energy consumption. Miniaturisation brings further potential energy savings whilst also rewarding the designer/client with greater freedom of placement."

Looking to the future and how LEDs may continue to evolve.

We will continue to see the rise in LED usage especially once the general public start to realise how much traditional lighting is costing them. The technology within the LED market will continue to grow and be developed and new advances in both quality and cost will be seen. Robert Chelsom, MD, Chelsom comments "LEDs only reach their claimed lamp life if they have an extremely good heat sink and good ventilation inside any luminaire.

Without that, the claimed 25,000 hour, 50,000 hour or even 100,000 hour lamp life can drop to under 10,000 hours. However, they are the future and will continue to develop with long lamp life, good colour and dimming capabilities. Be careful with dimming however, as it is essential that the LED lamps are compatible with the proposed dimming gear. Watch out for first cost too! LED lamps are still pretty expensive and need to be in use an awful lot to become cost effective against CFL equivalent options."

Tom Harrison, MD, MHA Lighting comments "As a manufacturer of lighting products that use LEDs as the light source the team at MHA hope Lighting Buyers are not deterred from making the switch to LED. The technology is here and the ever growing number of professional LED lighting manufacturers and suppliers are constantly innovating to create ever-improving solutions.

MHA Lighting's strapline - The future of lighting is here - is intentional. The technology really is here right now and the take up will be no less than phenomenal. For example, presently only around 10-15 per cent of the general lighting market is occupied by LED. This is set to increase to 64 per cent by 2020, resulting in a market value of \$75.6 billion."

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