

Next generation LEDs

Based in the UK with operations worldwide, Marl International is one of the pioneers in the LED industry. The company works with the world's leading LED component manufacturers and additionally specialises in developing and manufacturing LED products for particularly demanding environments, notably for the military and for the transport industry in the UK, Europe, North America, and Asia. Paul McDermott-Roe, Sales Director at Marl International, describes what he believes their key strengths are and highlights their recently formed partnership with Nanoco Group. The partnership should result in a new generation of cadmium-free LED lighting that is more sustainable and visually appealing than previous generations.

Marl was formed by Brian Ainley in Ulverston in 1972. He initially operated from his home, which was called Marl Park. This was utilised for the company name. One of the most significant market breakthroughs for Marl was securing Eastman Kodak as a customer, which eventually led to Marl supplying their dark room lighting requirements for the

manufacturing plants on a global basis. This was one of the first environments to truly take advantage of LEDs being utilised as illuminators and this led to the development of several ranges of products to suit specific applications. McDermott-Roe joined Marl International in February 2011. The company has developed quite a bit since

then, he says, and LED in general has also moved on. "LEDs have been around since the 1970s, as has Marl International. We've been a specialist LED manufacturer virtually from day one. This is an exciting time for us as recent innovations allow us to address wider markets." Notable in that regard is that the invention of efficient blue LEDs, developed in the 1990s, won three researchers the 2014 Nobel Prize in Physics. They overcame a series of physics and materials challenges, and were the first to develop techniques for producing large, high-quality, gallium nitride (GaN) crystals, needed to ensure that energy goes into light rather than heat, and they also dramatically improved efficiency allowing blue LEDs with phosphor to produce white LED to become a viable commercial technology. McDermott-Roe adds that this generation of LEDs also offers more lumens per watt, in other words is even more energy efficient, and that the cost has come down. The reason this all is so important and even merits a Nobel prize is because lighting currently accounts for one fifth of the world's energy consumption. If LEDs could efficiently replace conventional lighting, around the world, it would make a tremendous difference.

Marl's LED technology is integrated into lighting and indication products of some of the world's leading manufacturers, but the company also develops and manufactures end products itself. It claims that it has unique access to some of the best Solid State Lighting and Electronics technology in the world. "We are a solution provider, first and foremost," says McDermott-Roe. He points out that they have invested in a state of the art Surface Mount Technology (SMT) centre and LED assembly facility with a capacity to





process 80k components per hour, making it ideally suited to competitively support professional luminaire manufacturers who specialise in producing interior and exterior lighting, for example; sealed, linear and circular fittings utilising either COB or LOB technology. At the heart of the centre are I-Pulse M20 high performance, high flexibility SMT placers - the ultimate super-flexible multi-purpose SMT machines. These are coupled with custom designed loader and conveyor systems and two Lemme Neo 20 twenty stage Convection Reflow Ovens. "The SMT Centre provides us with the whole package; with competitive pricing, fast delivery, and quality that's second to none," says McDermott-Roe.

He emphasises that Marl International is particularly known for its specialist designs. The company has played a pioneering role in taking robust, efficient LEDs to the rail industry with LED products that offer a direct replacement for existing halogen bulbs in railway carriages. In a similar vein, Marl International delivers LED technology for military applications such as mine clearing equipment. "These applications all have in common that they place high demands on reliability."

The recently formalised partnership with Nanoco Group, a world leader in the development and manufacture of

cadmium-free quantum dots and other nanomaterials, again places Marl International at the forefront of new developments in LED lighting. Together the two companies aim to develop new products that feature Nanoco's cadmium-free quantum dot technology. According to a Marl International statement on the subject, quantum dots open up new potential for LED lighting – which currently lacks the same warmth and colour performance of an incandescent bulb – and have the capacity to appeal to a new set of buyers who want the efficiency and economy of the LED, as well as the "effect" of natural light. To date, the use of quantum dots in lighting was hindered by the fact that the technology contained cadmium, a highly-regulated and toxic heavy metal. Nanoco's quantum dot technology, made without cadmium or any heavy metal, offers a sustainable solution. The Nanoco and Marl technical design teams have focused initially on LED linear strips and ceiling mount flat panels – high-demand lighting solutions in professional environments that require specific correlated colour temperature and specific colour rendering index (CRI). Both lighting designs are currently available for customer demonstrations. McDermott-Roe believes quantum dot LEDs are ideally suited for digital signage, displays and other types or

architectural lighting as the quality of light in his view is superior to any other LED alternative. "The technology opens up new markets for us and for our customers. Horticultural plant growth is one of the new LED markets we're interested in. The latest technology advances have finally made LED lights a viable alternative for plant growers." LEDs can be used as plant growth technology with different wavelengths stimulating growth in different plants or different parts of plants. And according to McDermott-Roe: "We're just beginning to discover how endless the possibilities are with this technology. Our mission is to help our customers get the best out of LED, support them from concept to design through to manufacture, all in one house."



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