TRIDONIC

PRESS INFORMATION

Alight here for Crossrail

Tridonic helps FUTURE Designs to meet Crossrail's exacting specification requirements for an LED future

Dornbirn, March 14, 2019. If an entire infrastructure project is to be buried underground then it is obvious that the lighting will be of paramount importance. This is certainly the case with London's Crossrail line (aka the Elizabeth Line) which will significantly reduce journey times across London for millions when it opens in 2019. The decision to light all the stations, escalator shafts and concourses with LED lighting showed great foresight by Transport for London as at the time that the decision was made, LED solutions were still in the earlier stages of acceptance. "The decision to go LED on Crossrail was based on industry evidence that the benefits of reduced energy consumption and maintenance requirements would deliver a reduction in whole-life costs for the project;" said Paul Kerrigan, Crossrail MEP engineer (lead electrical). The brief was for the lighting to emphasise the spatial envelope rather than draw attention to the luminaires themselves.

The company tasked with meeting both the design and performance requirements was FUTURE Designs and they called upon long term partner Tridonic's knowledge and technical expertise to help them create a suitable bespoke lighting solution. The decision to use LEDs exclusively will significantly reduce energy consumption and maintenance costs that will ultimately lead to a reduction in whole-life cost of the project. FUTURE Design's concept uses the light-grey, matt-textured, glass-reinforced concrete lining of the station and escalator tunnels to reflect light onto the passenger areas, to create a sense of spaciousness within the underground environment and the company has created a range of new products, IKON, IKON EMERGENCY and PLINTH. All these luminaires have been designed specifically for Crossrail and address the technological difficulties presented with the design brief for the challenging environment.

IKON: powerful uplighter luminaire for indirect illumination

The IKON uplighter luminaire has been created to sit on top of wayfinding totems. This phenomenally powerful luminaire is designed to illuminate the area via the ceiling, which then reflects the light back down to the floor. To provide this level of light, FUTURE Designs utilised Tridonic's proven driver, LCAI 150W 350mA-1050mA ECO INDUSTRY drivers along with the LLE 24x280mm 2000lm 830 EXC modules, operating at a current of 950mA. The space between each of the totems bearing the uplighters is between 7-11 metres, therefore, these luminaires needed to produce 58,000 lumens / 850 watts (typical office lights are 5000 lumens / 32 watts). Weighing in at 80kg per unit and measuring just 685mm X 185mm across the lit face, the high wattage of IKON generates an enormous amount of heat from such a small area which needs be dissipated, and the most critical area of the design was calculating the precise dimensions and area of the bespoke heatsink to ensure that heat was drawn away from the LED system and regulating the device's temperature. Critically, as heat rises, the heat sink design had to draw the heat down away from the LED's of the unit which sits on top of the totem. Testing and prototyping for this specific section of the design took more than 350 hours and a series of original prototypes were built so that thermal tests could be carried out to establish that the heatsink would control the LED temperature correctly and safely.

Emergency luminaires to guide the way in the event of a power failure

IKON EMERGENCY luminaires are designed to automatically illuminate in the event of a power failure, helping to guide Crossrail passengers to safety. The design features high and low-level lights mounted on the sides of wayfinding totems and horizontal luminaires mounted on the front faces of the totems to spread light in all directions and throw the light across a large distance on the floors. Each emergency system is 35,000 lumens / 230 watts, as a comparison typical office emergency lighting would be 200 lumens / 5 watts. The lights are operated from a 230-volt generator. IKON EMERGENCY and the IKON totems will be installed in Crossrail stations at Tottenham Court Road, Farringdon, Liverpool Street, Bond Street and Whitechapel.

PLINTH uplighters with reduced glare for low level fixtures

PLINTH luminaire is located within the deck area between individual escalators. The uplighters are specially designed to diminish visual glare to passengers

travelling on the escalators, preventing direct view of the LED source and providing well balanced lighting. The positioning of the LED at a low level in the fixture and a black louvre at high level ensures dark light anti-glare illumination. The luminaire is sealed to IP68 with a high level clear glass panel. Due to the proximity of passengers using the escalators, safety elements required that the glass panel had to withstand a 1,000N load applied over a 50mm x 50mm area. PLINTH will also be installed in all five of the Crossrail stations. One of the challenges with this fitting was ensuring that faces would be illuminated when viewed on CCTV but at the same time ensuring that passengers were not dazzled as they travelled on the escalators.

Leon Ellis, Technical Director, FUTURE Designs, said; "We have worked with Tridonic on numerous projects but the technical challenges we faced with these designs were very specific. We were extremely grateful for the support they provided and we all learnt something from the process that we will be able to apply on future projects."

Background

Crossrail is the £14.8 billion new railway for London, which has 42km of new tunnels and once completed the new rail service will reduce journey times across the capital, increase central London's passenger capacity by 10% and bring an extra 1.5 million people to within 45 minutes of central London.

FUTURE Designs is an international manufacturer and supplier of top end lighting products and systems within the commercial, rail infrastructure, educational and residential market places. Operating across UK, Europe and The Middle East our reputation to design, develop, manufacture and deliver world class lighting products is second to none. FUTURE Designs ranks in the top five privately owned lighting organisations within its sector.

Picture 1 (IKON & IKON EMERGENCY 1)
The IKON uplighter luminaire sits on top of wayfinding totems to illuminate the area via the ceiling. IKON EMERGENCY luminaires mounted on the sides and the front of wayfinding totems automatically illuminate in the event of a power failure.

Picture 2 (IKON & IKON EMERGENCY 3)
The luminaires have been designed specifically for Crossrail and address the technological difficulties of the challenging environment.

Picture 3 (Escalator lighting – PLINTH)
PLINTH uplighters provide lighting for the escalator area of all five Crossrail stations

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About Tridonic
Tridonic is a world-leading supplier of lighting technology, supporting its customers with intelligent hardware and software and offering the highest level of quality, reliability and energy savings. As a global driver of innovation in the field of lighting-based network technology, Tridonic develops scalable, future-oriented solutions that enable new business models for lighting manufacturers, building managers, systems integrators, planners and many other types of customers.

To promote the vision of the “Internet of Light”, Tridonic relies on partnerships with other specialists. The goal is the joint development of innovative technological solutions that convert lighting systems into intelligent networks and thereby enable associated services. Its profound, technical industry expertise makes Tridonic an ideal partner for established brands and for newcomers to the market.

Tridonic is the technology company of the Zumtobel Group and is headquartered in Dornbirn, Austria. In the 2017/18 tax year, Tridonic generated sales of €352.7 million. 1,690 highly skilled employees and a worldwide sales presence in over 50 countries reflect the company’s commitment to the development and deployment of new, smart and connected lighting systems.

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