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Lighting India

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Vol. 13 No. 2

March-April 2018



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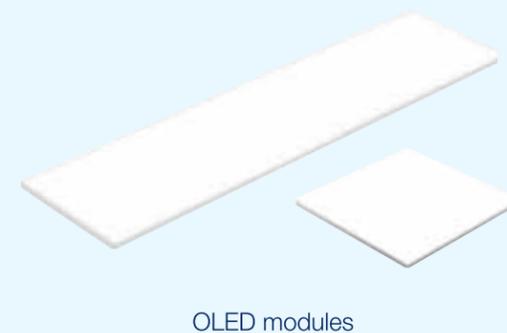
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Hello and welcome once again to *Lighting India*. I am writing this note from the picturesque city of Zadar on the west coast of Croatia, part of former Yugoslavia, rebuilt piece by piece after the country along with its neighbours was ravaged by war for nearly a decade in the early nineties.

A country with only about fourth of Mumbai's population (four million) receives tourists more than four times its population. I must say I was quite impressed by the lighting in the country as a whole. Especially the promenade along the entire coast of Croatia was worth visiting. The luminaires used on

the streets were eye-catching. The point of attraction was the Sea Organ at Zadar and the solar dance floor lighting. It was a symphony in the making. Designed by Croatian architect Nikola Basic, Sea Organ is an incredible nature-based instrument consisting of a set of 35 organ pipes installed in the floor of the jetty. It creates a beautiful music as waves lap at the coastline. And the natural solar lighting alongside makes it a fabulous evening set up for a light and sound show. Tourism is all about that. It's a must visit place whenever you are in Croatia.

Another place of attraction was the promenade along the coast of Split and Dubrovnik. Tourism and film production go hand in hand. The famous Hollywood movie Game of Thrones was shot in this beautiful city. Dubrovnik has reinforced its identity as 'Pearl of the Adriatic' through its lighting master plan done in co-ordination with architectural conservators. In fact, as one guide mentioned to me, the lighting plan has enabled energy conservation of about 60% and also reduced light pollution, despite still using high pressure sodium lamps at few places apart from latest LED technology. The walled old city of Dubrovnik has been beautifully and aesthetically lit by both sophisticated and modern luminaires.

Coming to this issue of *Lighting India*, we have a brief report on the Hong Kong Spring Lighting show held in April and the Light + Building show held a month earlier. I am glad to inform you that Lighting India will be present at the LED Expo this month. Do visit our booth C-72 in hall 4 in Mumbai. Hope you enjoy reading this issue as much as we have in bringing this to you. Should you have any query or suggestion, please email me at miyer@charypublications.in.

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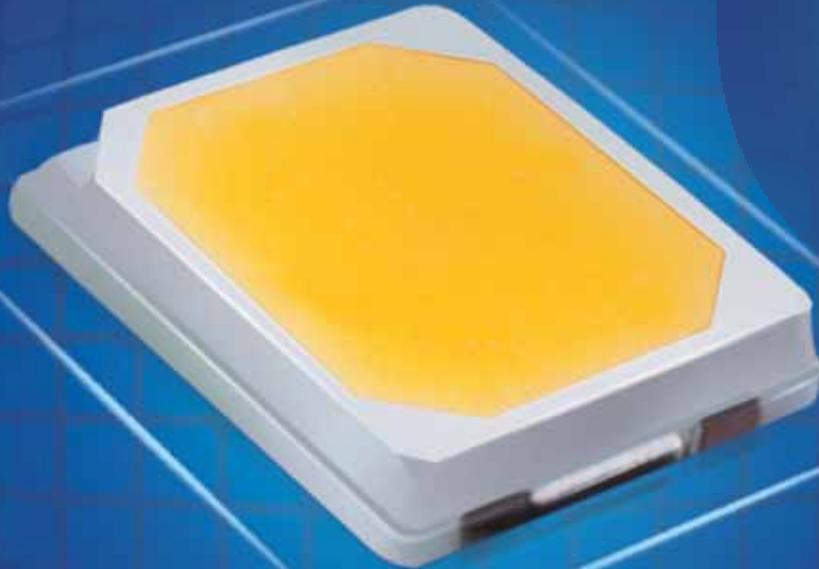
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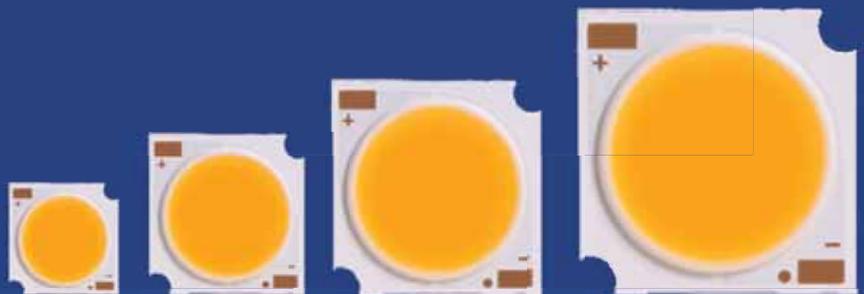
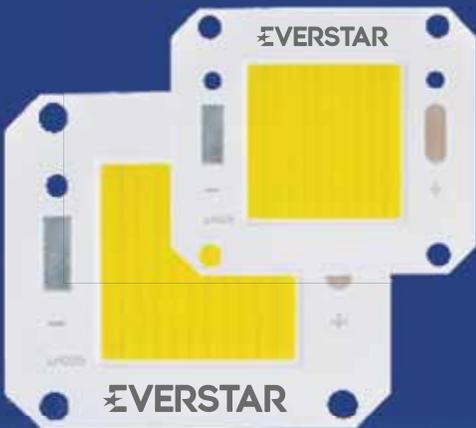


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The primary purpose of a lighting master plan is to establish functional and aesthetic criteria to improve the quality, consistency and efficiency of urban lighting for public place and security. Enhancing people's experience in the city after sunset, a lighting master plan outlines strategies to ensure that decorations are balanced with public safety, services as well as concern for energy efficiency.



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"India is an important market for us and we have installed this system in the companies..."

50

– **Rohit Harjani**
Country Manager
Indian Sub-continent, Hochiki





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LED emergency lighting from LEDVANCE



Adding LED emergency luminaires to its portfolio brings LEDVANCE yet another step closer to becoming a full-range provider, offering luminaires for a wide variety of applications, with proven features, high availability and a good price/performance ratio. Simple planning and installation as well as minimalist design to match the rest of the portfolio make the new stand-alone emergency luminaires even more attractive for installers.

The 'Emergency Downlights' are characterised by their high luminous flux of up to 335 lumen and optimised light distribution. As a result, fewer luminaires are required in a building for the prescribed light intensity and uniformity of the emergency lighting. The number of application options that can be covered by the just four different LEDVANCE models is quite remarkable. The round luminaires, in which the battery and driver are integrated, cover the important applications of escape route and anti-panic lighting with their three-hour operating time in case of a power cut. Their lenses have been perfectly adapted to meet safety requirements.

As escape route lighting, for example, the downlights provide a uniform, visible light strip on the floor over the entire route. Suitable for build-in or build-on installation, the downlights are available both with a built-in test switch for manual testing and with automatic test equipment (self-test). ■

EESL to install energy-efficient LEDs across all airports in India

Energy Efficiency Services Limited (EESL), a joint venture of PSUs under the Ministry of Power signed a Memorandum of Understanding (MoU) here today, with the Airports Authority of India (AAI) for installing energy-efficient LED lights at airports, buildings and facilities owned by AAI across India. EESL will make the entire upfront investment of Rs. 24.41 crore on the project.

The MoU is signed under the Buildings Energy Efficiency Programme (BEEP). The entire procurement of lighting equipment, installation and maintenance will be undertaken by EESL without any cost burden on AAI. The project will be completed within 4 months from the date of signing a definitive Energy Performance Agreement (EPA).

Under the MoU, EESL will execute the energy efficiency programme on Energy Service Companies (ESCO) model where the entire upfront investment is borne by EESL and recovery of investments is made through monetised shared savings. The contract period is five years and EESL takes complete responsibility of replacement / repair for the duration.

Saurabh Kumar, MD, EESL said, "Replacement of existing conventional light fittings with energy-efficient LEDs across airports and buildings of AAI will contribute significantly to India's climate goals. We have successfully transformed multiple commercial buildings in India into energy-efficient complexes. We are well on our way to radically transform the energy efficiency scenario in the country by retrofitting huge commercial complexes." ■



Saurabh Kumar

Larson Electronics releases Magnetic Mount Explosion Proof Rechargeable LED Strobe Light

Larson Electronics, a well known industrial lighting company, revealed the release of a powerful explosion proof strobe light that features 9 high-intensity LEDs and a rechargeable self-contained battery. This explosion proof LED beacon comes in red, blue, amber or white, and has a magnetic mounting system, making it a versatile lighting solution to combine with warning and notification systems in hazardous locations.

The EPSLED-RPS-80-SVS-M-HV is an 8-watt rechargeable explosion proof LED strobe light with a magnetic mounting system. This lighting system contains an explosion proof LED lamp, housed in waterproof copper-free aluminium and factory sealed with baked epoxy powder. This extreme durability allows the LED beacon to survive in hazardous environments and withstand far more abuse than other regular filament-based beacons. The solid-state LED can be ordered in red, blue, amber or white, allowing operators to choose an appropriate colour for their application.



EPSLED-RPS-80-SVS-M-HV

This battery-powered explosion proof strobe light has a total of 30 flash patterns to choose from and is powered with an 8.8ah lithium ion rechargeable battery. When fully charged, this fixture runs on 11-30V DC for up to 8 hours, providing extended illumination for warning systems in industrial sites, oil and gas facilities, warehouses and more. The battery can easily be recharged with the included general-area outlet wall charger - available in 120V or 240V. ■



High-Voltage Resonant Controller IC - ICL5101

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- › Shop lighting

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- › All operation parameters are adjustable with simple resistors to allow simple configuration
- › Stable low load operation mode
- › Comprehensive protection modes

Evaluation Board and Reference Design available specific to ESSL India requirements via Design partner/Distributors



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Gaana Bollywood promotes PR Lighting



Ananta Stagecraft called on a total of 172 fixtures from the PR Lighting catalogue to provide dynamic illumination for the recent Gaana Bollywood Music Project. This two-day event was held in the Indian capital of Delhi, and according to Ananta Stagecraft's Jay Joshi, the spectators were mesmerized by the spectacular lightshow.

Local company Ananta Stagecraft had recently invested heavily in PR Lighting, and as the official lighting partner for the event they were able to field 60 x PR XR 330 Beam II; 50 x PR XR 440 BWS; 38 x PR XR 480 BWS and 24 x PR XLED 4022RZ to achieve impressive brightness and versatility.

These fixtures populated two massive stages, both expertly designed by house lighting designers Jay Joshi and Sohail Mansuri to provide maximum bang for the buck.

The lighting designers themselves were hugely impressed. Said Sohail Mansuri, "I have never come across such robust fixtures until now.

"The weather conditions during production and for the show itself provided a major challenge. During programming hours the temperature dropped to around 6°, while during show hours it would soar to 4°. Yet the fixtures worked flawlessly and I was able to create immense designs."

Added Jay Joshi, "I have been working with PR Lighting fixtures since 2016 and they have always shone bright on my shows. I have never come across any problems, or the need to trouble shoot, as we regularly service them."

LIFX Smart Lighting now works with Microsoft

LIFX revealed that its users in the US can now control their lights with Microsoft's virtual assistant, Cortana. Cortana is the virtual assistant designed to help you get things done. It can set reminders and complete basic tasks such as turning LIFX lights on and off by simple voice commands.

With the Cortana integration, LIFX supports the leading voice assistants in the market, including Apple's Siri, Google Assistant and Amazon Alexa.

LIFX is on a journey to provide the best possible experience to its users by connecting its lights to the fast expanding range of smart home products worldwide. The aim is to go beyond offering the greatest lighting experience to help users shape the ultimate integrated home.

Tim Peters, Chief Executive Officer at LIFX, said, "The addition of Cortana extends the accessibility and ease of operation of LIFX smart lights. As a company born from innovation, LIFX continues to work with our partners to bring the vision of the connected home to more people, and introduce new ways for our customers to enhance their environments with the perfect lighting."

When you connect your LIFX Lights with Cortana you can turn your lights on and off, change the brightness, or control your home. ■



Now you can change the brightness of your lights with your voice.

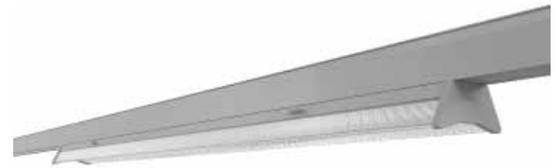
Licross: more than light

The new Licross trunking system from Osram enables applications that go far beyond light. With the new Licross trunking system, Osram Lighting Solutions provides a flexible and future-proof basis for numerous applications in industry and retail. It forms the backbone for all lighting tasks and, in combination with the extensive sensor portfolio, the e: cue Sympholight lighting control software and cloud-based data management, offers many useful features beyond light.

As a holistic lighting solution, Licross supports modern industrial companies in increasing their operational efficiency and optimising production processes.

You get an overview of resources such as employees, energy, and assets, recognise optimisation potential and can immediately initiate measures for improvement. At any time, sensors can be integrated in the lighting system, for example, for daylight or motion-dependent lighting control, for monitoring the ambient conditions (eg temperature, air humidity) and for hall utilisation. In combination with the cloud-based data management system Symphograph, data on the energy consumption and maintenance state (predictive maintenance) of the lighting system can be collected, analysed and visualised in the future, such as information on environmental conditions as well as movement and usage profiles in a hall (heatmapping).

The new trunking system presents itself in a functional design and impresses with its flexibility and investment security. It can be adapted at any time to changing room uses or extended with additional sensors. ■



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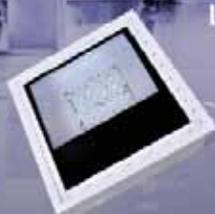


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Speirs + Major develop a Lighting Vision for the City of London



Picture Credit / Copyright – Jason Hawkes

With a major procurement of new street lighting and smart controls acting as the catalyst, this innovative study looks at the re-lighting of this important area of London which not only encompasses the city's major financial district but also its unique network of historic mediaeval streets and buildings.

The strategy suggests a holistic approach to controlling the various 'layers of light' including the street, amenity, architectural and landscape lighting throughout all the routes and open spaces. Pedestrian movement is prioritised and the overall experience of the public realm after dark is enhanced. New standards are suggested, along with the re-zoning of colour temperature and mounting heights.

The study also provides suggested treatments for a wide range of landmarks including St. Paul's Cathedral, the Guildhall, Smithfield Market and several historic bridges, as well as for a wide range of character areas including the Culture Mile, Bank and the Riverside.

Importantly the study looks to balance concerns for creating a safe, secure and legible environment, supporting the night-time economy and creating a focus for the City's residential community with potential environmental impacts such as energy use, light pollution and light spill. ■

Robe is a Familiar Face in Slovenia

The fourth season of the top-rated 'Your Face Sounds Familiar' franchise in Slovenia was produced by POP TV and featured eight celebrities engaging in a series of singing impersonations – taking off local and international artists - over 12 episodes, which was voted on by a combination of judges and the public, with the public having the final say on the winner.

It was lit by Ziga Krajnc who worked closely with Matjia Kacin who designed a scheme of LED strips and panel products closely related to the set, and scenic designer Milan Vukadin. Ziga this year chose Robe moving lights as the main fixtures on a dynamic rig, including BMFL Blades, Spiiders, LEDWash 1200s, Pointes and LEDBeam 100s, around 80 in total, which were supplied to the production by Event Lighting, Slovenia's largest rental company.



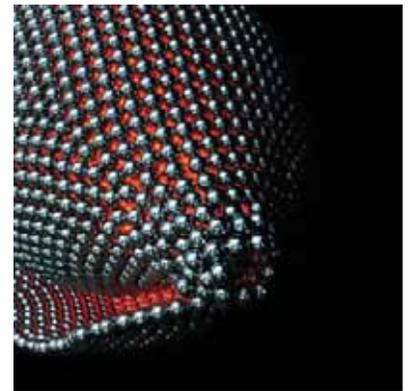
Twenty LEDWash 800s were at the back and front above the stage and on side ladders. They were ideal for lighting additional performance factors like choirs or dancers.

Twenty-four Pointes were rigged at the back on ladders and on the floor and sides, used for whizzy chases and the powerful and dynamic beam effects for which they are known and loved, together with all the bumps, accents and quick hi-impact transformations that are so vital for this style of television.

He also used 8 x Robe MMX Spots high up at the back, essentially in the final lighting layer position of several making up the wide shot looks. ■

Sogani showcases in high-end Modern Design Lighting at Light + Building 2018

A signature brand of lights and light installations, SOGANI by Vibhor Sogani - with an experience of 25 years in the design fraternity – travelled to Germany to unveil three new collections of Light Installations, each of which was bespoke and unique. The first Indian designer brand showcased in the *high-end modern lighting design* segment, SOGANI exhibited in Hall 1.1, Stand B30 at the fair. One of the biggest platforms of its kind in the world, Light + Building is a biennial architectural design and technology trade fair mainly focused on the fields of lighting, electrical engineering, building automation, and civil-engineering software. The fair was held at the Messe Frankfurt in Frankfurt am Main.

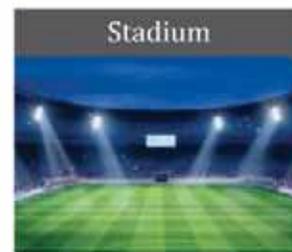


Under the leadership of International Award Winning Artist & Designer, Vibhor Sogani, the studio's eclectic repository of over sixty *indigenous designs* continues to grow as it explores broader avenues of concept light installations. At brand SOGANI, *quality craftsmanship and creative design solutions* that add value and beauty to everyday life are quintessential. Along with avant-garde aesthetics, the designs fuse innovative use of material with state-of-the-art technology to create lights that are *bespoke and sculptural*. Personalised and exclusive, each piece is customised to suit the desired space and lifestyle. ■

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XtraLight reveals New Slim Architectural Strip LED



XtraLight LED Lighting Solutions revealed the release of the Slim Architectural Strip (SAS), a fresh take on architectural lighting. Designed with the architectural specifier in mind, the SAS packages style and performance into their smallest linear profile luminaire yet.

XtraLight's new Slim Architectural Strip luminaire is a specification grade LED strip that's ideal for offices, conference rooms, retail, educational buildings, and hospitality spaces. With expanded optical and finish options, the SAS can be customised to fit any existing architecture.

"The Slim Architectural Strip is a high performing, prime alternative to similar fixtures from conglomerate manufacturers in the market," says Jerry Caroom, CEO at XtraLight. "Not only is it backed by our 10-year warranty, its manufactured here in the United States."

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- Best in class LEDs with 3000K, 3500K, and 4000K CCT (min 80 CRI).
- Emergency battery back-up and energy-saving occupancy sensors are available, factory installed.
- Backed by a 10-year warranty. ■

Transrail's 'Lighting Infrastructure' business to soar heights

Integrated Power Transmission and Distribution Company, Transrail Lighting, is experiencing a growth trajectory in its Lighting Infrastructure business. The company expects its lighting infrastructure division's revenue to grow at a healthy 15-17% CAGR over the next three years.

The company made foray into lighting infrastructure business in the year 2010 with setting up of a state-of-the-art lighting pole manufacturing and galvanising facility at Silvassa, U.T. Since then, the company has designed, manufactured and installed over 2 Lakh poles and 6,000 high masts. In its first year of operations, the company successfully won and executed two marquee projects of high masts at Pallekele Cricket Stadium at Candy, Sri Lanka and Maharashtra Cricket Association Stadium (Sahara Stadium) in Pune, India.

With an innovation driven business strategy, the company has emerged as one of the leading players in Lighting Infrastructure business in India. It is the first company to create the largest gantry structure in India at a highway in Maharashtra measuring 110 meters. Transrail has also manufactured and type-tested structures for railways and Nagpur Metro. These structures are expected to set a new trend for all future Metro rail projects in India. Another innovation to Transrail's credit is 'Curved Poles' that it has installed on Sahar Elevated Road at Mumbai International Airport. Transrail is the only company in India that has Pole Bending Facility. ■

Tailor-made LED lighting system for dSPACE in Paderborn

The central elliptical atrium of the headquarters of dSPACE in Paderborn can be seen for miles around thanks to the new LED lighting. Luminaire manufacturer Erventec worked closely with Tridonic to develop a new LED lighting system for the atrium, adapted



specifically for the ceiling geometry. The system not only meets high demands in terms of design but also consumes only half as much energy as the previous solution.

dSPACE in Paderborn is often cited as a classic success story. Founded in 1988 as a spin-off from the University of Paderborn by Dr. Herbert Hanselmann and a number of partners, dSPACE now employs 1,400 people from 34 nations worldwide on creating successful hardware and software for developing and testing control devices for the automotive and aviation industries. By the summer of 2006 the site of the original headquarters in the Paderborn Technology Park threatened to burst at the seams – a new building was needed and the company moved into the new building in 2010.

The headquarters in central Paderborn has is flooded with light, giving it an open feel. The heart of the building is the generous atrium with its staircase and two glass elevators. Leading off from the central hall are the four wings of the X-shaped building containing the office spaces. The basic elliptical shape of the impressive void extending over all the floors is repeated in the clerestory roof. ■



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ERP Power names Jeffrey Frank CEO



Jeffrey Frank

ERP Power LLC (ERP), a leading provider of small, smart and connected LED drivers for the lighting industry, revealed the appointment of Jeffrey Frank as Chief Executive Officer (CEO). Frank previously served on the ERP Power Board of Directors, and most recently as ERP's Chief Commercial Officer. ERP co-founder Michael Archer will focus on his role as Chief Technology Officer while transferring his CEO duties to Frank.

ERP Power LED driver products are rooted in the expertise of ERP co-founder and CTO Michael Archer who changed the computing industry by designing ever-smaller power electronics for notebooks, desktops and servers for companies like Apple, Dell, HP and IBM. Today, ERP is focused on powering the Internet of Lights with the world's smallest indoor and outdoor LED drivers featuring tri-mode dimming, intelligent controls, wireless mesh connectivity and programmable outputs to save energy, time and money.

Frank will leverage his 30+ years of experience in the power electronics industry serving in CEO and sales leadership roles to help ERP refine its strategic direction; leverage an interoperable ecosystem of connected lighting products; expand opportunities in commercial and industrial LED lighting end markets; and accelerate follow-on M&A activity.

Prior to joining ERP Power, Jeffrey Frank served in senior executive roles at GE Power Electronics, Lineage Power, Cherokee International, Lambda LEI, and Deltec Electronics. Jeff was instrumental in the successful turnaround of the OEM business at Lineage Power, which was acquired by GE Energy. Frank led Cherokee International as CEO during its initial public offering in 2004, and was responsible for the company's strategic decision to expand its manufacturing footprint in Shanghai, China. Jeffrey Frank earned masters in marketing from Webster University and Bachelor of Science degree in business from Carroll University. ■

Kevin Martin joins Lumileds as SVP of Quality



Kevin Martin

Lumileds revealed the appointment of Kevin Martin as Senior Vice President (SVP) of Quality. He has over 30 years of experience in Quality, most recently serving as VP of Global Quality at Flextronics.

"We are thrilled to have Kevin join our organization to continue to strengthen how we deliver advanced lighting solutions at the highest quality level," said Mark Adams, CEO of Lumileds.

During his time at Flextronics, Martin led the worldwide Quality team supporting global operations in North and South America, China, Europe and India. Prior to Flextronics, Kevin served as VP of Total Customer Satisfaction at

Nissan Motor, where he was responsible for North and South America field quality and customer satisfaction for all Nissan and Infiniti vehicles.

Prior to Nissan, Kevin was the General Manager of Customer Quality Engineering at Toyota. In addition to roles in Quality, Martin has held positions in production, manufacturing operations and engineering. Martin has a Bachelor's Degree in Manufacturing Engineering from Western Carolina University.

"I am excited to join Lumileds and help further our commitment to quality across our growing customer base," added Martin. ■

Per Lindeberg new CEO of Aura Light



Per Lindeberg

Per Lindeberg has been appointed new CEO of the Swedish lighting company Aura Light International AB. Per has most recently worked in a leading role in the Sonepar Group, where he for example worked as CEO and Managing Director of the Oakwell Group.

Per Lindeberg has extensive management experience within large multinational enterprises as well as from industries in rapid technological transformation. He has also co-founded several successful companies.

We welcome Per Lindeberg to Aura Light and we believe that he will be successful in his new role thanks to his strong operational and

management experience, said Lennart Sundén, Chairman of the Aura Light Board.

Aura Light has a strong brand and is recognised for its high quality, innovative and sustainable lighting. The lighting industry is changing rapidly and I look forward to be part of the company's future development, said Per Lindeberg. Per Lindeberg succeeds Martin Malmros, who has been CEO for Aura Light for ten years.

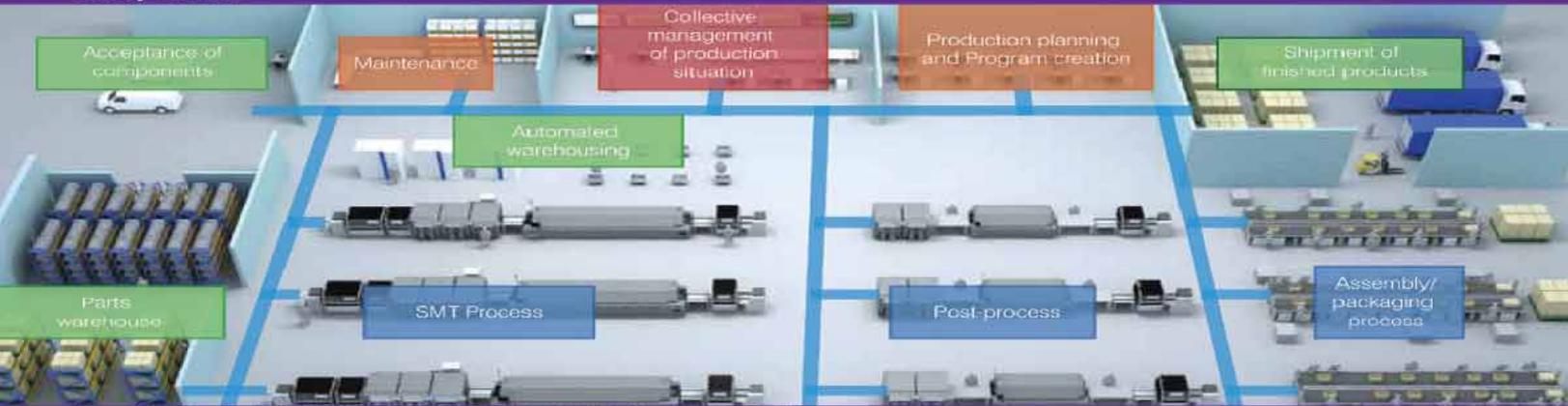
We thank Martin for his ten years of service. Martin has successfully taken the company from a Nordic light source producer, to a global and sustainable lighting solutions provider, said Lennart Sundén. ■

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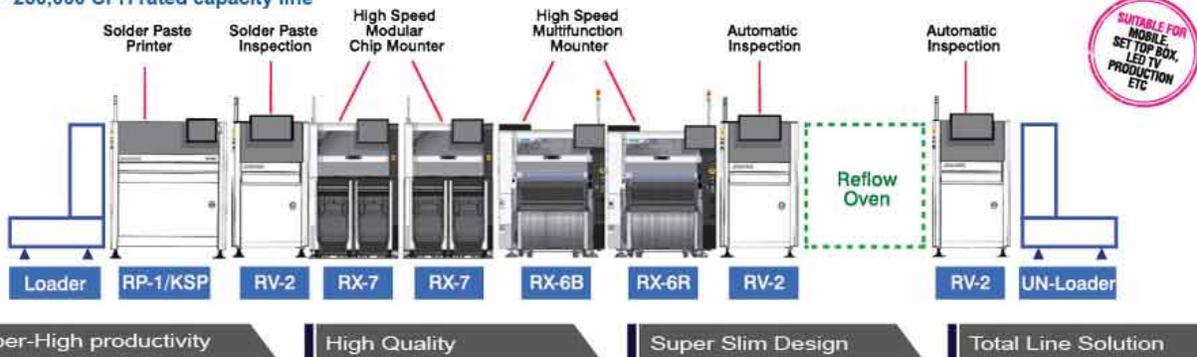
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Shell Lights bags Top Prize at the 2018 World Media Awards

The winners across the eight categories of the 2018 World Media Awards were revealed at an exclusive VIP event held at The Ham Yard Hotel in London. Hosted by the World Media Group, the World Media Awards, now in their third year, are the only global awards to recognise brands, agencies and media partners who, together, create the most effective cross platform, cross border, content-driven advertising campaigns.

The biggest winner on the night was Shell, whose global campaign 'Shell Brand GravityLight & Bedtime Stories' created by MediaCom, picked up the World Media Awards Grand Prix, as well as winning the World Media Award for the Corporate Influencer category. Shell's campaign was in conjunction with Gravity Light, a foundation which aims to improve the lives of people without electricity by providing clean, safe and affordable lighting. They embarked on a 50-day GravityLight roadshow across Kenya, capturing the



progress of the roadshow through video and social media, and also created animated videos of GravityLight 'bedtime stories' told by high profile influencers, such as singers Pixie Lott in the UK and Luan Santana in Brazil - all of which created strong consumer connections globally and transformed brand perceptions.

A panel of 24 senior jurors from leading advertisers, agencies and publishers, had the difficult task of selecting the eight category winners and Grand Prix winner. ■

StandardVision wins 2018 LEDs Magazine Sapphire Award

StandardVision, a well known designer and builder of experiential and architecturally-integrated LED digital media solutions, has won the 2018 Sapphire SSL Outdoor Lighting Award in recognition of their customisable and individually-designed integrated LED lighting systems for the Wilshire Grand Centre's façade.

The Sapphire Awards recognise individuals and teams in the LED-based solid-state lighting (SSL) market from an enabling-technology and elegance-of-design perspective.



"We are excited and honoured to receive this award," said Adrian Velicescu, Chief Executive Officer & Chief Creative Officer of StandardVision. "After years of hard work by all parties involved, the Wilshire Grand now stands as a landmark in DTLA. The seamless integration of customised narrative lighting would not have been possible without the tireless efforts of our teams, so we thank and share this recognition with them. We look forward to continuing as a

market leader in the development of individualised, cutting-edge integrated lighting systems." ■

ADATA D8000L LED Power Bank wins iF Design Award 2018

ADATA Technology, a leading manufacturer of high performance DRAM modules, NAND Flash products, and mobile accessories, is proud to share that one of its products has again secured a prestigious iF Design Award. The D8000L LED power bank took an iF Design Award for 2018 as chosen from 6,402 entries by a 63-member jury made up of independent experts from all over the world. The D8000L was noted for its powerful LED light, versatile practicability, and rugged durability, with thoroughly-tested IP54 dust and water proof specifications.

The D8000L is devoted to multiple LED bulbs that form a uniquely powerful light source. Rated 200 lumens, the LED bulbs integrated into the D8000L benefit from ADATA lighting expertise and experience. The D8000L therefore serves as much more than just a power bank, delivering powerful illumination that can be a literal life saver in many situations. For users spending time outdoors, the 17 hours

of light provided by a fully charged D8000L are extremely helpful. Lighting has four modes: standard, flash, slow flash, and emergency. In addition, the D8000L has been tested to IEC IP54 dust and water proofing standards, giving it good resistance against particulates and liquids. It is also clad in tough, shock-absorbing materials, resulting in a product perfect for usage anywhere from homes to offices and active lifestyles. The grooved back of the D8000L proves very handy, designed so that consumers can use anything from coins to credit cards as impromptu kickstands to prop the power bank up with ease.

Packing 8000mAh, the D8000L has two USB ports that output a total of 2.1A. Users can recharge two devices at once to save time, and do so with total peace of mind thanks to a shock and fire-resistant build. Like all ADATA power banks, the D8000L employs smart multi-protection circuitry designed to prevent overcharge, over-discharge, overvoltage, under voltage, overheating, overcurrent, and short circuits. ■



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Emergency Lighting Market to be worth 6.68 Billion US\$ by 2022

Some of the major players operating in the emergency lighting market are Philips Lighting Holding B.V. (Netherlands), Hubbell Lighting Inc. (US), Cooper Industries (Ireland), Schneider Electric SE (France), Emerson (US), Legrand S.A. (France),...



Picture Credit: www.omni-hk.com

According to a report by MarketsandMarkets, the emergency lighting market is expected to be valued at US\$ 6.68 Billion by 2022, growing at a CAGR of 7.83% between 2017 and 2022. The growth of this market is driven by the combination of emergency lighting with esthetic lighting, booming construction industry globally and the continuous advancements in the upcoming products.

Market for LiFePO₄ battery in emergency lighting expected to grow at the highest rate during the forecast period

LiFePO₄ stands for lithium-iron phosphate battery. It is a kind of lithium-ion battery which has long life, high temperature resistance and have small volume and light weight. LiFePO₄ is becoming the preferred choice for emergency lighting not only because the batteries are physically smaller but also they draw far less power when they are charging. LiFePO₄ can also last twice as long as traditional emergency lighting batteries such as nickel cadmium or nickel metal hydride. Therefore, they are largely deployed for emergency lighting systems.

Emergency lighting market for LED light source expected to grow at the highest rate between 2017 and 2022

LEDs are energy-efficient and their price has been declining since the last few years. Therefore, they are largely

used for emergency lighting systems. The market for incandescent light is declining because these are often considered as the least energy-efficient type of lighting commonly found in residential buildings. The old-generation light sources are being slowly phased out and LEDs are preferred as they offer a longer working life and also consume less energy.

Emergency lighting market in APAC expected to grow at the highest rate during the forecast period

The emergency lighting market is rapidly expanding in APAC. The focus on real estate projects where lighting is a basic requisite is a major driver for the growth of this market. The countries such as India and China within Asia Pacific are still seeing rapid urbanisation. Hence, the overall growth and demand for infrastructure is higher compared to Europe and North America. Some of the major players operating in the emergency lighting market are Philips Lighting Holding B.V. (Netherlands), Hubbell Lighting Inc. (US), Cooper Industries (Ireland), Schneider Electric SE (France), Emerson (US), Legrand S.A. (France), Acuity Brands (U.S.), Beghelli S.p.A. (Italy), Daisalux (Spain), Zumtobel Group (Austria), OSRAM Licht AG (Germany), Digital Lumens (US), Fulham Co. Inc. (US), Arrow Emergency Lighting Limited (Ireland), Arts Energy (France), and Taurac (US). ■

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Comprehensive conversion

ZF Friedrichshafen has placed its confidence in Waldmann's efficient downlighters in its industrial buildings

ZF Friedrichshafen AG equipped its production buildings at its Friedrichshafen site with efficient LED lighting, and is reducing its power consumption by 75% in the process. The Group reached its decision after an extensive examination of various lighting solutions, opting in favour of Waldmann's ACANEO downlighters for industrial buildings.

Modern light for modern production facilities

The view into this production hall, now almost 36 years old, is truly gigantic. This is where one of the world's largest automotive suppliers manufactures components for transmission and suspension technology. Although the products manufactured here are highly innovative, the lighting was starting to show signs of its age. When the decision was taken to replace the old industrial vapour lights with modern LED lighting, efficiency was just one of the factors in the equation. At several points, the fluorescent elements in these old luminaires had failed a long time ago, but due to serious access problems - some units being located over burner systems - it was not a simple task to replace them. The maintenance of this lighting system had become a very costly proposition. In addition, the employees did not feel comfortable about switching off the lighting themselves, because the switching layout was not obvious, and it could take a very long time to switch the lighting back on again. As a consequence, these power-hungry lamps were lit pretty much all the time.

Needs-based lighting

The new lights were installed in the same locations as the old ones. Now they are grouped to reflect the sequence of production operations. They can now be switched on and off very easily by employees, or controlled centrally via DALI. However, to ensure that the artificial lighting in use at any one time is only ever the amount actually required, the ACANEOs across these production areas are all equipped with brightness sensors, as well as with motion detectors over the vehicle and pedestrian access routes. The production areas are illuminated to 600 lux, a figure higher than that stipulated in the standard governing workplaces, ensuring that ZF employees have great visibility. Scientific studies have proven that higher levels of lighting reduce the incidence of accidents, mistakes and signs of fatigue, and that this generally tends to enhance employee performance. However, the aisles are illuminated to a perfectly sufficient level of 150 lux.

A well thought-out choice

Those responsible calculated that this lighting system could be amortised over about 2.5 years. If the order situation



Photo: © Waldmann

About 1,000 ACANEO lights deliver optimum lighting conditions in the production facilities at ZF Friedrichshafen AG

should call for 3-shift operation, that period would actually shorten. The decision in favour of ACANEO was not one reached lightly. Instead, lighting systems from 25 manufacturers were subjected to a very thorough investigation. Employees evaluated the sample lighting installed on a questionnaire, backed up by a few measurements to check the figures quoted by the manufacturers.

The lighting quality and low glare levels of ACANEO set it clearly apart from the others. The choice in favour of Waldmann lighting was reinforced by its ease of installation, its price-performance ratio and its energy efficiency figures.

Successful implementation

These industrial premises were converted during ongoing operations and at weekends. Many of the intricate and awkward locations were reached by using steeplejacks - industrial climbing specialists. Despite all of this, installation was completed faster than had been calculated. The original schedule envisaged completion by March, but the complete system was installed between Christmas and the end of January.

The employees are very satisfied with their new lighting. The intensity and quality of the lighting received very favourable comments indeed. For the decision-makers, success was also enhanced by the freedom from maintenance and the cost-savings achieved. ■

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The Colour of Light: spectrally optimised light from BÄRO

Contemporary lighting concepts – in the retail sector or elsewhere – always aim for an individual balance between technical effectiveness, economic efficiency and emotional appeal.



Light creates an atmosphere – and it supports the attractive presentation of all kinds of objects and products. From fresh foodstuffs or dishes in a restaurant, non-food products, fashion and leisure articles – lighting with a coordinated spectral composition can render the colour, material and surface properties of products in a way that shows them off to best advantage to customers and users. Successful sales-promoting lighting therefore deliberately engages with expectations and visual habits – and triggers positive associations.

The perception is decisive

The technology behind this is based on how we humans see and interpret colours. With LED standard and special light colours with different spectral compositions the perception of certain colour shades typical to products can be adjusted in a surprisingly wide range. For example, depending on the lighting the red of a tomato can appear warmer or cooler, more or less saturated. The art of product lighting that optimises the products' own colours is to use light spectrums tailored to different applications.

The best known application of this type is the illumination of fresh meat and cold cuts. Even here it becomes clear that lighting which optimises the inherent colours of products is always a balancing act: on the one hand traders and customers want to achieve an attractive product presentation, but on the other hand this must never cross the line into

falsifying or masking the products – a question of sensitivity. Here the experience that BÄRO has acquired over many years and successfully transferred to LED technology is decisive.

Twelve light colours for every application

LEDs offer numerous starting points for defining and influencing light spectrums. BÄRO has developed a wide range of LED light colours in close cooperation with its technology partners. This is divided into standard light colours, colour-intensifying light colours and product-specific light colours to

meet different requirements. Even the range of standard light colours that is oriented to the black body locus is wider than usual: with the four white tones 927, 830, 835 and 840 it comprises colour temperatures from a warm 2700K to a neutral-cool 4000 K.

The colour-intensifying spectrums from BÄRO comprise the light colours PearlWhite, which particularly saturates yellow and orange surfaces, BeColor, which particularly intensifies warm surface colours and gives surfaces a rich natural and coloured appearance, and BeCool, a special light colour that serves to intensify the colour of cooler surface colours.

Fresh products, perfectly presented

Last but not least the range of product-specific LED special light colours is unrivalled. It ranges from the light colour Sun, which makes fresh fruit and vegetables in particular shine, to GoldenBread, Fish&Seafood, the classic SpecialMeat and its new alternative FreshMeat, which makes the white parts of meat and cold cuts appear particularly neutral. This is especially important for popular fine meat types such as marbled dry aged beef, Wagyu or Iberico. This means that BÄRO customers in the retail and food trade currently have no less than twelve LED light colours at their disposal – a professional instrument which enables a suitable and harmonious light balance to be developed for every retail project, every brand and every salesroom situation. ■

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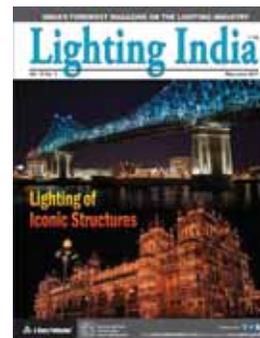
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GHIAL converts airfield ground lighting signage to LED

GMR Hyderabad International Airport Ltd. (GHIAL), which operates Rajiv Gandhi International Airport (RGIA), Hyderabad has revealed that in line with its commitment to be 100% LED airport, it has completed the project of converting entire Airfield Ground Lighting (AGL) signage from CFL (Compact fluorescent lamp) to LED (Light Emitting Diode) lamps.

A total of 132 units of AGL signage were converted from CFL to LED in a span of two weeks. More than 350 LED strips of 10W power were retrofitted to these signage. All these installations meet the mandatory regulatory requirement and maintain the required photometry level as per the operational needs. These signage are deployed across around 1700 acres of the airside.

With the upgrade to energy efficient LED signage, RGIA would save almost 45% of energy used over the conventional lights. The energy thus saved will reduce the airport's dependency on traditional non-renewable sources of energy,

slashing the greenhouse gas emission, which in this case translates to reduction of over 20,000 Kg of CO₂ per annum. Airfield Ground Lighting Signage acts as a guidance sign post at the airside to help the pilots in identifying the location of their aircraft while at the airside and also while taxiing to the designated areas.

There are typically two kinds of signage at the airside-mandatory instruction signage and Information signage. Mandatory instruction signage has the inscription in white on a red background. This type of signage includes information on Runway Designation; Category I, II or III Holding Position; Runway-holding Position; Road-holding Position and No Entry zone. Information signage are provided where there is an operational need to identify a specific location, or routing (direction or destination) information. These include information on direction, location, runway exit, runway-vacated and intersection take-off. AGL signs are used in the night time and in case of low visibility during the daytime. ■



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Lighting Master Plan

Public Spaces and Security

The primary purpose of a lighting master plan is to establish functional and aesthetic criteria to improve the quality, consistency and efficiency of urban lighting for public place and security. Enhancing people's experience in the city after sunset, a lighting master plan outlines strategies to ensure that decorations are balanced with public safety, services as well as concern for energy efficiency.

The function and form of public space at night is determined mainly by artificial lights. A light guides pedestrians, cars and bicycles along roads and paths, and also influences their speed of travel. It also illuminates the dark corners and facilitates the safe passage of pedestrians. It highlights architecturally significant structures, defines space and can transform background of buildings into canvases for colour, shadow and motion. It also allows public

spaces to be enjoyed during night time, altering our landscapes to allow for unique and new evening experiences. Similarly, light serves as a wayfinding tool, reinforcing neighbourhood boundaries and identities, and influencing how we perceive and move through a certain space.

Until recently, functional and financial interests of municipal bodies have largely dictated lighting design in public spaces. Few cities throughout the world have

Photo 1: Canopy of illuminated lanterns in Public area in New York's Brookfield Place



Photo 2: An example of well illuminated Public Park



incorporated aesthetic considerations for lighting into urban planning initiatives.

Unlike so many other urban features, lighting cannot be designed in isolation as its glow affects the greater urban environment. With little investment, interest or coordination of urban lighting by many municipalities in the past, over-illumination or light pollution has negatively impacted natural habitats and is a nuisance to neighbouring residents. Poorly coordinated lighting strategies can compete and conflict with one another, detracting from both the aesthetics and functionality of urban spaces and our cities.

In order to increase the ability of improved urban lighting to enhance public spaces and streets (not to mention improve urban liveability, the perception of public security and economic vitality), below given are a few recommendations:

Evaluate existing urban lighting and identify opportunities for additional illumination

Evaluating existing lighting installations would allow the city or a public area to correct improperly placed



Figure 3: Intelligent street lighting (smart lighting) in a street of Melbourne

or directed light, such as that which unnecessarily spills into the sky or into adjacent buildings. Improving bad illuminated public areas could improve the functional and visual quality of it and help to promote positive public attitude and safety toward future urban lighting initiatives. The better the people understands the effects of and responses to existing public lighting, the better the installations and lighting plans will be in the future plans. Many parks, open areas and public spaces in any city would benefit from increased illumination (refer Photo 2).

Take advantage of good examples, tested concepts and technologies

Around the world, innovative technologies and lighting plans are being tested, so why not reap the benefits of those best implemented examples. For example, Melbourne has been testing intelligent lighting fixtures allowing lights to be turned on, or off (refer figure 3). These lights can even be dimmed as necessary to reduce energy consumption in the early hours of the morning when users are not there. Implementing tested concepts in any of the local projects would help the city or area cut costs and eases installation.

Investigate performance-based standards for street lighting

Introduction of municipal engineering standards for lighting will ensure the street illumination consistency throughout the city or any area. Light reinforces the intended purpose, mode and speed of travel along a street through fixture height and spread of illumination. Continuous road lighting has proven to support higher speeds and strengthen the supremacy of the vehicle.

In Canada, 'performance-based zoning' is becoming an increasingly popular means of setting parameters for mixed-used development projects through goal-oriented criteria rather than prescriptive requirements. Performance-based specific standards for urban lighting could allow for similar workability for the luminance of city roads. In Melbourne, street lighting is organised hierarchically allowing for maximum illumination on main traffic routes and reduced illumination on local or internal streets.

The city of Vancouver in Canada has venture to incorporate interesting and novel lighting design into new development (refer figure 4). Exploring performance-based engineering

standards for areas with low vehicle traffic would reinforce the intensions of the lighting plans and place the public and pedestrian realm at the forefront of planning and development. A study of street lighting standards are desired by both planning and engineering departments of municipalities in order to fully explore the functional and visual opportunities of performance-based standards for street lighting.

Develop a lighting master plan

A lighting master plan does not dictate design, but guides development towards a balanced, appealing and organic lighting program. Because of the diversity of technical people involved in urban lighting projects, full coordination is required to ensure that full, local benefit is achieved and a unique image of the city or an area is developed.

The primary purpose of a lighting master plan is to establish functional and aesthetic criteria to improve the

quality, consistency and efficiency of urban lighting for public place and security. Enhancing people's experience in the city after sunset, a lighting master plan outlines strategies to ensure that decorations are balanced with public safety, services as well as concern for energy efficiency.

In any city or area, a lighting master plan would fulfil a number of purposes. It would guide the coordination of illumination, ensuring that light stability is assessed before development. Focussing on city's future goal, it would allow for the clarification and extension of lighting components found in existing city plans and detail environmental deliberations. A lighting master plan would strengthen urban lighting as a tool to enhance wayfinding, present local level character and enforce a sound image for the city or any area.

Public Lighting Strategy, 2013, city of Melbourne proves a valuable case study for lighting master plan. Melbourne views urban lighting as

Figure 4: High impact busy traffic street in downtown Vancouver, Canada

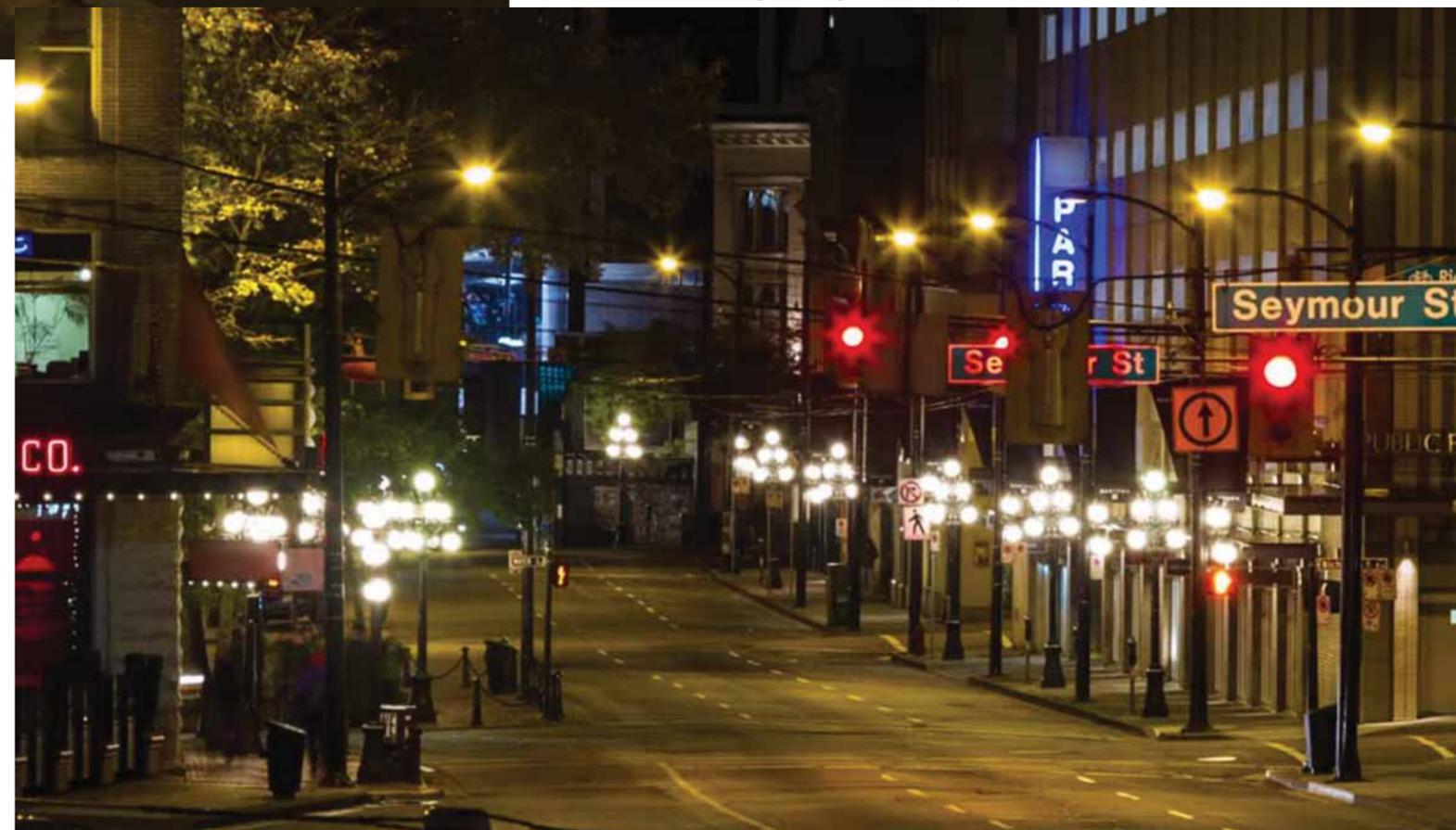




Figure 5: Lighting in Public space on a street of Melbourne

integral to increased personal safety and economic prosperity – seeing it as a tool to make the city “...more liveable and attractive.” Sometimes the local climate of the city or area provides an additional opportunity to use colour and illumination to improve the visual quality of the public realm in overcast weather.

A good street or public area may be functional but a great street or public area is superior in its character and quality. Throughout the world, cities are having immense opportunities to improve urban liveability, economic vitality and the perception of public security only by improving the illumination

of our public spaces or streets. A devotion to public realm enhancements means enhancing the areas that we value and use, both during the day and at night. ■



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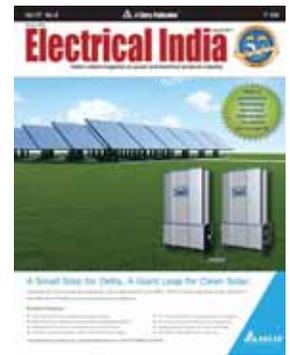
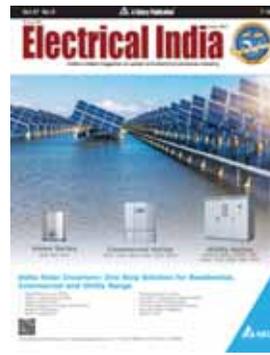
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Singapore's Changi Airport Group commissions major new experiential media features to enhance and entertain at different stages of the passenger journey. Changi Airport Group commissioned Moment Factory to collaborate on two media features designed to entertain passengers as they navigate the airport's remarkable interior. Peranakan Love Story brings traditional Singaporean shop house façades to life at the heart of the airport's Heritage Zone.

Photo Credit : Moment Factory



Peranakan Love Story



A house with a breathing landscape

Perched on an urban setting, this residence exhibits an unconventional facade comprising of decks and glazing, dynamic in nature. The design treats the space as an urban sanctuary, the architecture of which follows fluidic forms. The home is a juxtaposition of varied experiences - the insides merging with the outside, achieved by introducing openings at all levels.

Situated on a tight site of 40' by 70' in an urban context, the client approached us with a brief of designing a residence for a joint family with members across a varied age group. The challenge in this project was to accommodate a dense program in a tight site.

We grappled with the issue of providing private spaces for all the members, without compromising the feel of an independent residence, as opposed to a multi-level residence. Arranging the programs vertically enabled the creation of a stratified effect with the facade. Individual spaces across three levels enabled us to maintain privacy for the family members. The fragmented arrangement of these individual spaces, created break-out spaces at each



level, which facilitates the congregation of the family members.

A large cut out which spans through the vertical volume of the residence, enables the members to constantly be in visual connectivity with each other. This also creates a sense of continuity in terms of the volume when a member enters at

Project Description –

Name of the Project.....	Strata
Project Typology.....	House
Built Up Area	8935 sq ft
Site Area.....	2800 sq ft
Location	Bangalore, India
Project Completion	December 2016
Photo Credit.....	Anand Jaju
Structural Consultant	S&S Consultants

the ground level and ascends through the residence. The interiors have been designed to look opulent and luxurious, in a non-typical manner, replacing the traditional carvings with more contemporary finishes, making the spaces look more chic and glossy.

Each level has been designed with features that aid sustainability. The pool in the ground floor helps to cool the air that moves up to the higher floors through the atrium. The court and the deck in the first and second floors respectively are deeply recessed areas that not only promote interaction

between the family members but also help in experiencing the lush green trees around the house. The terrace garden becomes an important sustainable feature to cut out the heat passing through to the lower floor. The landscape outside and within the house promote the experience of green living in the urban scenario. The triple height court ensures a physical and visual connection within the volume.

Moving away from the notion of a conventional facade comprising of decks and glazing, a dynamic façade is crafted as a composition of static and dynamic strata. These facilitate



the opening of the residence to the existing green foliage outside the site by introducing apertures at all levels. Appearing to be a stack of hollowed out spaces and fluid forms. This allows the members to have a visual connect with the outside and moreover appreciate the foliage that exists. The facade albeit is an assemblage of elements, is a contrast to the internal volume of the residence, which is vertically continuous from the ground level onwards.

The palate on the inside is neutral; a muted blend of white and a single shade of marble. With a specific brief of no wood in the interiors, and the design approach of fluid forms, a lot of MDF has been used with a CNC finish. Gypsum has been used extensively and flexibly for all the partitions, beds etc. combined with solid acrylic surfaces and lamination paints. The external finishes are intended to be more rustic in nature, in order to blend with the landscape. An object has been sculpted in the façade, and finished in white stucco to contrast with the rest of the rustic surfaces.

The house is a collage of individual aspirations and design ideologies. Each private space has been closely detailed with the member, and tailored to suit their briefs. It was a challenge to maintain a cohesive language throughout the house. The large family enjoys their individual privacy, at the same time congregating at various cavities interspersed throughout the levels of the house. ■





Flynn Talbot

“As in any business, if you are passionate enough about it you can do whatever you want”

Flynn Talbot is an Australian lighting artist and designer based in London, UK. He creates lighting installations and commissioned pieces for galleries and unique buildings along with innovative lighting products for serial production. In a recent conversation with Lighting India he talks about his journey so far and his projects.



What led you to the Lighting Industry?

It was an organic journey. I studied product design straight out of high school and actually we did only one small lighting project. After I graduated I wasn't fulfilled by working on products or furniture, I was looking for something with more depth, something that I could control in a more sensitive way and when I discovered what's possible with lighting I was hooked.

Could you tell us about your initial days when you started off?

After graduation I worked in a local lighting store in Perth that sold Flos, Luceplan, Erco, Kreon, and all these amazing brands from Europe. This was the start of my fascination with light. I would take apart the fixtures and see how things were done. And I would design installation for the shop window on very low budgets. It was a creative freedom that I loved.

What drove you to commence your own company?

I am head-strong and like doing things my own way. As soon as I was in the right place to start my own studio, I did. I really like to be in full creative control of my projects so I know they are executed with absolute precision, so the experience for the audience or consumer is as I see it in my mind. And I could only get that by driving everything myself.

How has lighting industry evolved globally?

I'd say light has become more separated from Architecture and has become more fluid. We are no longer bound by traditional floor lamps or pendants or downlights but light can now be integrated within spaces in more human and more organic ways. This is very exciting for the future of our built environment. Also with LEDs, fixtures are smaller and more concealed and this of course offers many new opportunities for designers.

Could you talk about few of your projects? What inspires you to pursue specific projects?

I guess the one I'm most known for now is my 'Reflection Room' installation at the Victoria & Albert Museum in London last year. That was very hyped up and gained global press. There I wanted to transform this amazing former textile gallery with light and material so create a very immersive experience for my audience. I used my story of light which is the combination of saturated orange and deep blue light to create an installation with tension and polarity.

Can you explain a bit about the creative process with regards to lighting for Art installations?

I look for opportunities to create new experiences, whether in a gallery, a museum, hotel or a product. I try to see what's new that I can bring to the table to offer something new to the world. I first think about what the experience is that I want to create and then start to consider possible lighting effects and materials that will help build that vision. Everything that will take away from the experience is removed or concealed so the lit effect is always the focus.

Any message for the budding lighting designers?

As in any business, if you are passionate enough about it you can do whatever you want. Just be curious, learn as much as you can, talk to people and take things apart and see how they work. ■

Demand for Energy-Efficient Lighting Solutions to Boost LED Lighting Market

The global LED lighting market will grow from US\$ 36.75 billion in 2015 to US\$ 92.40 billion by 2022, at a CAGR of 13.66% during the forecast period. To take advantage of incredible cost and energy savings from the use of LED lights, government organisations, restaurants, and hospitals are retrofitting buildings and switching to LEDs from conventional lighting.

Nowadays, almost everybody is talking about implementing light-emitting diodes (LEDs) in the lighting sector. The US Department of Energy (DOE) has been at the forefront of the solid-state lighting revolution. DOE has supported a market study predicting the market penetration of LED in general illumination applications ever since 2002. Approximately 50% of the general indoor lighting industry and 40% of the general outdoor lighting industry are said to have been engulfed by the LED fever as per various lighting expert sources. Several research studies have shown that the LED implementation awareness has grown steadily. But, what are the reasons for the much hype about this LED lighting? Let us check out the main factors for the adoption of the most sought-after LED technology in this article.

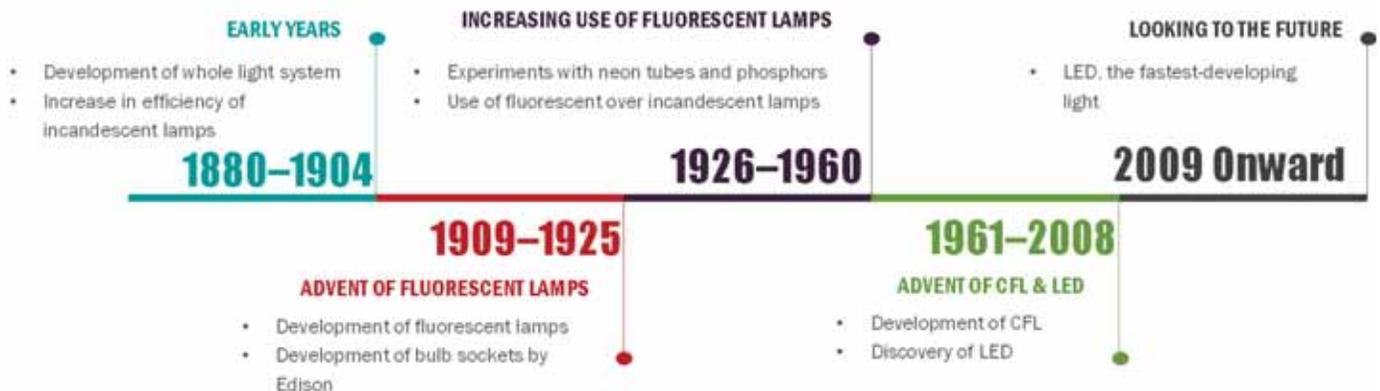
Key Benefits of Using LED Light Sources in Indoor and Outdoor Environments

■ **Competitive Advantages:** Most of the lighting professionals rely on LED as it provides them competitive advantages. Most of the lighting companies have already implemented LED solutions. LED is an efficient solution, boosting the productivity of workers, and enabling better quality control, easier operations (instant on/off), safety, and cost-efficacy. LED enhances light levels and illumination quality, reduces light energy consumption

significantly, requires less maintenance, and offers rebates (60% of the project). The LED is also eligible for tax savings (according to the Energy Policy Act). By 2030, LED lighting is estimated to reach 84% market share of lumen-hour sales in the general illumination market. This will reduce lighting energy consumption by 40%, for 3.0 quads (261 terawatt-hours) savings, worth over US\$ 26 billion (as per the current energy price) and equivalent to the total energy consumed by ~24 million US homes.

- **Huge Cost Savings:** In accordance with the US Energy Information Administration (EIA), a 60-watt incandescent lamp on an average produces 16 lumens per watt and has a lifetime of 1,000 hours; a CFL produces 67 lumens per watt and lasts for 10,000 hours; and an LED produces 83 lumens per watt with 30,000 hours lifetime. The long-term energy and financial savings from the shift in lighting technology are consequently huge. In addition, the cost of LED lamps is estimated to drop, and their competence and lifetime are expected to improve. EIA forecasts if the LED light usage predominates by 2027, the lamps can reduce the energy consumption of 441,000-megawatt electric power plants annually.
- **Great Opportunities:** LED lighting provides great opportunities to the commercial, residential, industrial,

Evolution of Light and LED lighting



Source: White Papers, Expert Interviews, Industry Journals, and MarketsandMarkets Analysis

Attractive opportunities in global LED lighting market

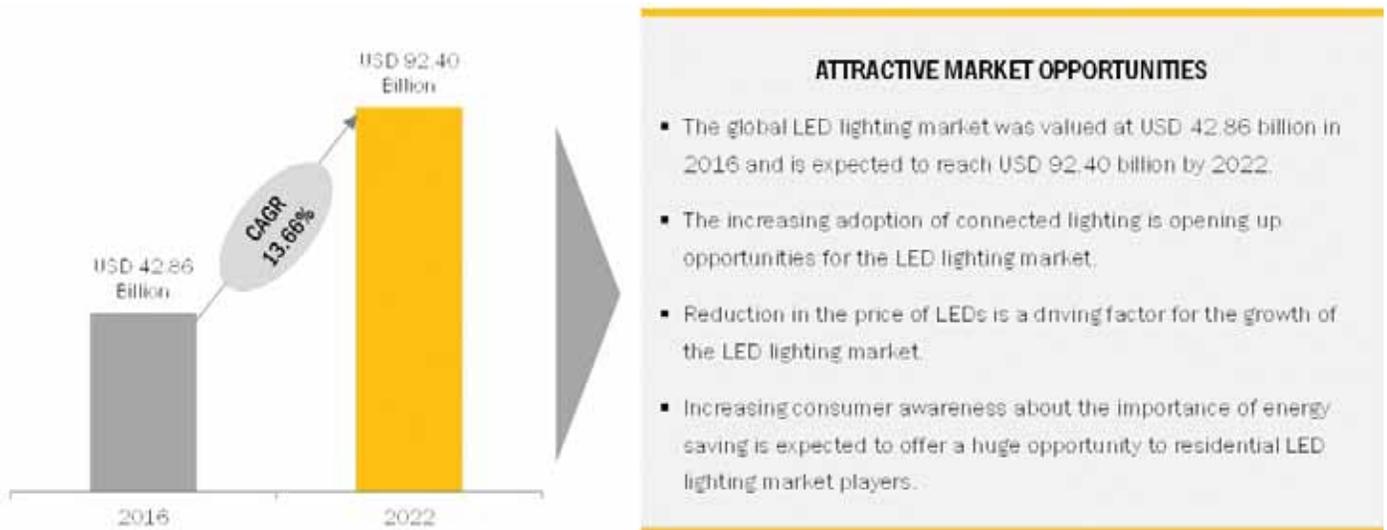


Figure 1: LED lighting market offers lucrative opportunities OWING to increasing adoption of connected lighting

Source: Investor Presentations, Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

highways and roadways, architectural, public places, and other lighting applications. Lighting solution providers can build highly effective LED systems for a building and even an entire highway network, digitally. Even if energy savings from LED are quite impressive (as cited by MarketsandMarkets), there is a huge opportunity for further savings by accelerating investment in cost and efficiency improvements.

- **Growing Market:** According to MarketsandMarkets, the global LED lighting market will grow from US\$ 36.75

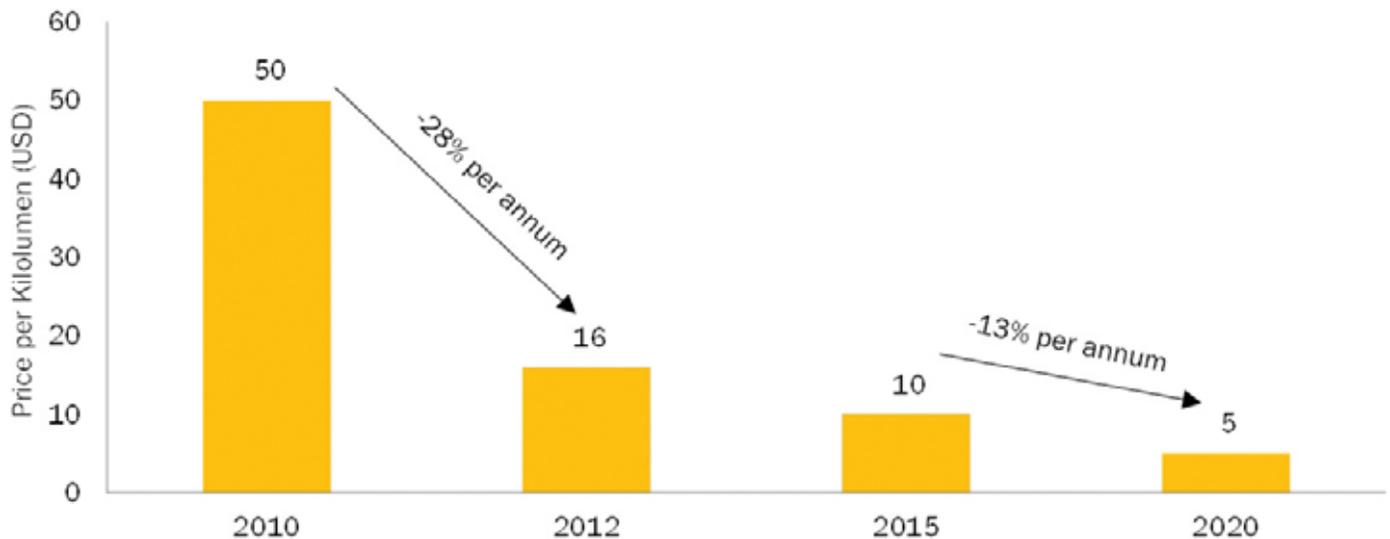
billion in 2015 to US\$ 92.40 billion by 2022, at a CAGR of 13.66% during the forecast period. To take advantage of incredible cost and energy savings from the use of LED lights, government organisations, restaurants, and hospitals are retrofitting buildings and switching to LEDs from conventional lighting. To cater to the growing market for LED illumination and ease installation and conversion costs, software companies and manufacturers introduced lighting as a service (LaaS) model as a new approach for installing and controlling LED lights. Illumination is now

Key industry insights



Source: Industry Experts and Primary Interviews

Figure 3: Reduction in LED prices



Source: US Department of Energy

powered, connected, and controlled digitally through LaaS.

The innovation encompasses short- and long-term gains, such as reduced energy costs, improved energy efficiency, and the ability to harness and inspect a wide array of digital analytics. LaaS can lead to major cost savings for restaurants and hospitals, as well as for highways that are part of trade corridors. Significant cost savings can also be harnessed by retrofitting conventional hospital lighting systems with LED lights and using LaaS system.

- **Low Maintenance Costs:** Usually, LED illuminations have 6–10 years of life span when continuously operated, whereas fluorescent illumination needs to be changed every year, adding up maintenance fees. Facility administrators can include daylighting controls in patient rooms with enlarged window space, saving energy consumption and costs. In accordance with the US DOE, natural lighting exposure can lead to 12% increase in patient recovery time, 2.5% decrease in staff absenteeism, improved productivity and job satisfaction, and psychological well-being. Unoccupied space, such as restrooms, stairwells, mechanical rooms, and service areas, can be controlled and dimmed through LaaS to reduce energy consumption and costs.

Global LED Lighting Market: Key Global Trends

- Lighting Control to gain a pivotal role with LED owing to long-term increase in functionality. LED will lead to a more complex control system, offering comfort, security, and flexibility to end users.
- 2013 and 2014—the breakthrough years for LED in the professional market in Europe, North America, and China. 2014 saw important inroads for LED in the large residential market, and the highways and roadways

lighting market, which let LED to pass 40% and ~38% penetration of entire lighting sales in 2015.

- LED replacement bulbs made considerable progress in residential application globally.
- Europe and North America to mature first—higher growth rates during the forecast period in younger markets.
- Europe—Implemented EU ban on incandescent and prospective ban on halogen, driving LED adoption in the region.
- North America—Incandescent ban stimulated demand; utility rebates making solid-state lighting (SSL) affordable.
- Latin America—Price is a key barrier to the adoption outside of high-end projects. LED will increasingly be able to challenge CFL.
- Asia Pacific—China and India embracing LED and leading change for the region.
- Middle East and Africa—Growth expected in the second half of the forecast period due to sharp decline in LED price.
- Revenue Forecast Globally—2013–2022 (North America, Europe, Asia Pacific, Middle East and Africa, and Latin America)—APAC is the largest market.
- Revenue Forecast by Application—Commercial (retail, office, and hospitality), industrial, and public places and highways and roadways lighting will have higher growth rates, and residential lighting will have the largest market (in terms of revenue) by 2022.
- Asia Pacific—the largest market for both indoor and outdoor LED lighting worldwide. The market scenario in this region features aggressive expansion of production facilities by manufacturers, anticipating a positive outlook. Residential and commercial applications will boost the market for indoor general lighting. Nevertheless,

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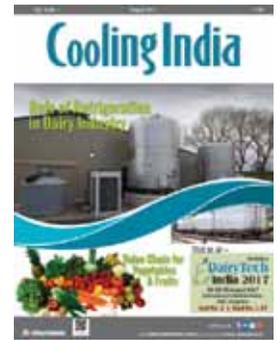
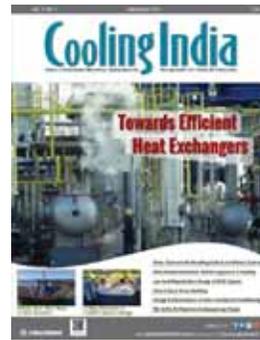
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residential users are projected to drive the market with slower adoption than commercial applications in offices, hotels, hospitals, and other areas.

- India is expected to be one of the most profitable markets, largely supported by favorable government initiatives and increasing awareness pertaining to the benefits of LED lighting among end users. The Government of India's LED program is expected to emerge as a win-win from the consumer point of view. The government has changed the contours of procuring and distributing LED bulbs across India, putting the project on the fast track. With the improvement in economies of scale and number of producers, LED bulbs will become more affordable. Moreover, the smart cities initiative by the Government of India is uplifting the demand for LEDs as an energy-efficient lamp source.
- Smart buildings and smart cities, on behalf of convergence of green and smart technology trends, will become progressively important and a driver for consultancy-based services.
- Performance contracting is progressively becoming a market mainstay—end users are enthusiastic about maximising cost savings and enhancing competence.
- LaaS (leasing-type models and “pay-as-you-use” services) gaining a grip in the industry for enabling businesses to reduce upfront capital expenditure.
- Cloud-based services with strong data interpretation focus will be key enablers for new-generation intelligent buildings.

Companies such as Philips Lighting Holding B.V. (Netherlands), Cree, Inc. (US), OSRAM Licht AG (Germany), GE Lighting (US), Eaton Corporation plc (Ireland), Dialight plc (UK), and Zumtobel Group AG (Austria) are identified as the key players in the LED lighting ecosystem.

Companies such as Digital Lumens (US), Fulham Co., Ltd. (US), LED Engin, Inc. (US), Lumenpulse Group (Canada), Neptun Light, Inc. (US), Tanko Lighting, Inc. (US), and LED Lighting Systems, LLC (US) are identified as key innovators owing to their contribution to the LED lighting market in the form of innovative solutions.

Summarising Key Points

Several end users are deploying smart LED solutions owing to their cost-efficiency and ecofriendly nature. The LED revolution is driven by Asia Pacific, Europe, and North America. Further growth in the LED market will be less centralised and challenge the leading global participants. LED replacement lamps are now at a price point that can effectively challenge conventional technologies and take over the market significantly by 2020. The challenge is to provide non-commoditised products, making the most of digital LED illumination advantages. LED drivers and lighting management solutions will be the key factors.

LED Revolution across the Globe

- **Retrofitting bases with LED light:** It is a boom time for US LED manufacturers under President Donald Trump for securing major lighting contracts.
- **IoT set up a standard for sensors in LED fixtures:** Top LED producers, Internet of Things (IoT) technology companies, and industry groups established the IoT-Ready Alliance for the installation of IoT technology in luminaires. The alliance is setting industry standards to enable LED light fixtures to be IoT-ready, facilitating a swift and easy installation of superior IoT sensors—as simple as changing a light bulb.
- **Lighting now considered a significant element in urban residential development:** New government regulations supporting sustainability and the awareness about environmental issues are the prime growth drivers for LED lighting. Rapid technological evolutions in this domain are driving the adoption of intelligent lighting in both residential and streetway spaces.
- **Strict energy compliance regulations from the European Commission:** Using energy efficiently, Europeans can lower energy bills, reduce reliance on external oil suppliers and gas, and protect the environment. Energy efficiency has increased at all stages of energy chain, starting from generation to final consumption. EU has planned 20% energy savings target by 2020, equivalent to turning off 400 power stations. In November 2016, the European Commission proposed an update to the Energy Efficiency Directive, together with new 30% energy efficiency target for 2030, and actions for updating Directives to meet new targets. Policies for improving energy efficiency in Europe comprise an annual decline of 1.5% in national energy sales; EU countries making energy-efficient renovation to minimum 3% of buildings (central governments); minimum energy efficiency standards and labeling for products such as boilers, household appliances, lighting, and televisions; preparation of National Energy Efficiency Action Plans every 3 years by EU countries; and other measures.

LED Implementation Future—Roads Ahead 2017

LED replacement lamp is the winner in the medium-term for replacing conventional technologies worldwide. LaaS on cloud-based networks for customised application management will pave the way for connected lighting, living, and enhanced energy and facility management. Capitalising, leasing, and maintenance are other service models expected to evolve around LaaS. LED lighting controls are a new-generation lighting management system to target verticals—highways and roadways focusing on safety, offices focusing on energy saving aspects, and residential focusing on ambiance.

Residential

- **Low Energy Saving**—A part of growing zero-emission concept

- High Effect/Ambience—Mainstream due to falling price and increasing end-user awareness

Offices

- High Energy Saving—Potential in retrofit and new smaller offices—still plenty
- Low Effect/Ambience—Controlling the CT/red, green, and blue (RGB)/color rendering index (CRI) for enhancing the well-being and productivity of workers

Retail and Hospitality

- Low Energy Saving—Strong demand from secondary facilities (corridors, staff rooms, etc.)
- High Effect/Ambience—LED increasingly used in ambient lighting for influencing customer mood

Industrial

- Low Energy Saving—Still low penetration and large potential (warehouses)
- Very Low Effect/Ambience—Creating the best lighting environment for assembly and precision working

Highways and Roadways

- Replacement of high-pressure sodium (HPS) lights with LED lights
- Smart city projects installing LEDs with solar panels

Architectural

- Ambience to shape public buildings at night
- Artificial movement of lights to create shape and edge attracting users

Public Spaces

- Increasing outdoor entertainment activities attracting

modern stage lighting

- Need to increase operational efficiency for airport perimeters to ensure luggage check with ease
- Stadium installing LED floodlights

Gear Up for the Revolution

Market participants should work in association with building management system (BMS), and lighting and HVAC companies. With robust growth forecast, establishing market presence, a network of connections, and customer relationships is essential for future success. With performance contracting becoming the preferred business model of customers, suppliers need to develop service capabilities or associate with facility management companies and energy service providers for partaking in the dynamic part of the market. The global adoption of innovative lighting solutions has been on an upswing with amazing success in the European and Asian markets.

Even if LED solution has high initial setup cost, it should not be ignored for getting the long-run benefits in the industry. The companies should not shy away from implementing LEDs; they should rather treat this as an investment to keep pace with technological growth. It would be better if the organisations can get rid of all skepticism about LED lighting services and move toward fast LED implementation. LED streamlines project operations in the commercial and industrial sectors. ■

Adopt this technology for cost-efficiency, increased delivery speed, and enhanced profitability.



Shrikant Mahankar

Senior Analyst
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Alarka Ghosh

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Changi Airport is taking its passenger experience to a new level with Terminal 4. Changi Airport Group commissioned Moment Factory to collaborate on two media features designed to entertain passengers as they navigate the airport's remarkable interior. Voted by air travelers as the World's Best Airport (Skytrax) for the fifth consecutive year, Singapore Changi Airport is taking its passenger experience to a new level with Terminal 4. Moment Factory is proud to have collaborated with the Changi Airport Group to design and implement its brand new architectural media installations. The Immersive Wall creates a totally new kind of security area, where epic content on a 10K LED screen transports travelers before they've even passed through the scanner.



Photo Credit : Moment Factory

Immersive Wall





“India is an important market for us and we have installed this system in the companies...”

Hochiki Europe is one of the world leaders in fire detection. They have introduced a brand-new concept to the UK market - an innovative new Emergency Lighting system, **FIREscape®**. This system is a unique, highly cost effective and environmentally friendly emergency lighting system based on LED technology and is the UK's first to be fully intelligent. **Rohit Harjani, Country Manager Indian Sub-continent, Hochiki**, talks to **Lighting India** about the new system and the entry of it in the Indian market.

Q Could you explain us the concept of 'Emergency lighting system'?

A Evacuation is the most important step during any emergency to stop or to avoid any mishap. In case of any emergency, escape route lighting system comes to force and aids people to evacuate from the building. It is a unique, highly cost effective and environmentally friendly emergency lighting system based on LED technology and it is also the first fully intelligent system in UK.

Q What are the key highlights of FIREscape® system?

A FIREscape® is an intelligent emergency lighting system. The emergency light cabling is installed using the 'branch structure' method, which means that several 'branches' can be teed off from the main cable for different floors and areas of a building. It offers battery back-up and

features addressable, self-contained luminaires and signage connected via screened, extra-low voltage (40V) cabling. The product also offers the installer a brand new and easy solution to the installation of emergency lighting and signage.

Q What is the need for the system?

A FIREscape® brings new technology with new opportunities and solutions for emergency lighting. Following are the needs for the system.

- **Extra Low Voltage**
Less than 5% energy consumption compared to traditional lighting*1
- **Low Maintenance**
Less than 5% lamp changes when compared to traditional lighting*3

• **Simple Installation**

Luminaires fit onto the standard Hochiki Europe sensor mounting base (YBN-R/3)

• **LED Technology**

Low carbon emissions – less than 5% CO₂e compared to traditional lighting*2

• **Intelligent**

Unique intelligent addressable technology allows control and testing of individual luminaires

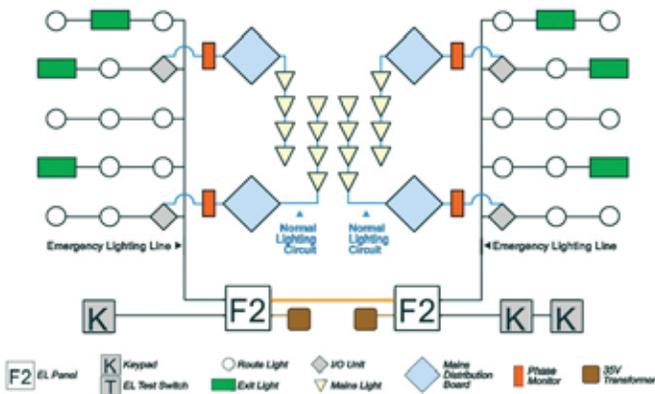
• **Graphics Software**

Allows instant overview of complete system and assists in maintenance tasks



Q Could you tell us about the process of the system?

A The diagram below shows a typical multi-panel FIREscape installation. The two EL-2 control panels are networked and these may be controlled by EL – KP leypads. The diagram illustrates how the system does not contain any mains wiring beyond (a) the EL-2 power supply and (b) the connection to the normal lighting circuit distribution board via the EL – PM (Sub-circuit) Phase Monitor



Quick and Easy Installation

Installer-friendly emergency lights are literally fitted at the turn of a hand. The cabling and bases for the luminaires can be installed in advance.

The luminaires themselves can then be attached to the bases during the final phases of building construction. In

this way, the units are protected from construction-related dust, dirt or damage.



Q What are the benefits of this system?

A Following are the benefits of the system:

• **Environmentally friendly in energy costs and CO₂e emissions**

A FIREscape® exit sign luminaire consumes less than 0.5W, including the power loss. A similar 8W fluorescent light exit sign luminaire will consume approximately 12W. When compared to 230V LED lights, FIREscape® products save more than 50% of energy. The lower energy consumption directly correlates with lower CO₂e emissions. For example, replacing 100 230V fluorescent exit luminaires with FIREscape® LED-based exit lights, CO₂e emissions would be reduced by 2,100 KG annually. The graph below shows a total cost of ownership comparison based on a 1000 luminaire, 80% non-maintained 20% maintained, emergency lighting system for manual-test, self-test and Hochiki's FIREscape® system, over a 10-year period.

• **Exit luminaires and emergency exit signs share the same circuit**

FIREscape® is an intelligent emergency lighting system. The emergency light cabling is installed using the 'branch structure' method, which means that several 'branches' can be teed off from the main cable for different floors and areas of a building. Due to its programmability, exit and route lights can be freely installed anywhere on the line without having to group them into either exit or route lights. The EL-2 control panel constantly monitors the condition of the luminaire batteries and LEDs and can be programmed to perform the periodical testing and reporting required by legislation.

• **Easy installation**

Installer-friendly emergency lights are literally fitted at the turn of a hand. The cabling and bases for the luminaires can be installed in advance. The luminaires themselves can then be attached to the bases during the final phases of building construction. In this way, the units are protected from construction-related dust, dirt, or damage.

• **Reduced cabling costs**

Cabling of the FIREscape® system is easily and quickly achieved using traditional screened cable. Fire-rated cable is not required because each luminaire on the system contains an integrated rechargeable stand-by battery. Lighting lines are wired as radial circuits with

spurring permitted. FIREscape® allows the connection of the cabling to luminaire bases before installing the emergency light units. Light units are fitted to the base with a simple and fast 'twist-fit' method, reducing installation time.

- **Luminaire line length 500/1,000M**
- **A cost-efficient system to implement and maintain**
- **Two lighting lines, up to 127 devices per line**
- **Operational reliability; luminaires feature integral stand-by batteries**
- **Automatic luminaire battery and LED health testing features**

Totally unique within the emergency lighting industry, the FIREscape® luminaires are connected using just a standard screened cable, which reduces installation costs traditionally associated with emergency lighting systems. A fire-rated cable is not required because all FIREscape® luminaires are equipped with integral stand-by batteries allowing the luminaires to function in fail-safe mode even in situations where the control panel becomes damaged or inoperable or the line cable is severed. The luminaire batteries allow continual operation in excess of 3 hrs. In this way the FIREscape® emergency light system fulfils the Emergency Lighting standard, BS5266. See our freely available 'Guide to BS5266' booklet for more details on the system design standard.

- **Easy to service and maintain**

The EN 50172 emergency lighting system standard has placed particular attention on the operational condition of emergency light systems. The system should be regularly tested once a month, as a minimum. The EL-2 control panel continuously monitors the status of the luminaire LEDs and stand-by batteries. Information on completed tests is stored in the memory of the panel and test reports can be printed for end-user records. Malfunction/alarm information is displayed on the screen of the keypad.

Q How is it a greener solution to Emergency Lighting?

A The FIREscape® system is based on LED (Light Emitting

Diode) solutions that consider the useful life of the entire emergency light system, from its installation to the recycling of the equipment at the end of the life-cycle.

The FIREscape® emergency light system uses fully recyclable materials that do not place an unnecessary burden on the environment. Due to their unique extra low-voltage solution, cabling costs are reduced by 60% during installation when compared to old central battery-based systems.

Due to their self-contained backup power source, the FIREscape® lighting devices can use screened, non-fire rated cabling, instead of heavy and costly fire-resistant cabling, reducing the installation costs associated with traditional emergency lighting systems.

The environmentally friendly values in the FIREscape® emergency lighting system are specifically evident in the energy costs and CO₂e emissions, which are associated with using and maintaining the system.

The graph (right) compares the energy consumption and CO₂e emissions of emergency light systems using traditional mains-powered fluorescent technology, a mains-powered LED equivalent and the extra low-voltage FIREscape® system, on an annual basis in a 100-luminaires installation.

The FIREscape® emergency light system has also been designed, bearing operational safety and user-friendliness in mind. An internal control system has been included within the system. It constantly controls the condition of the lights' LEDs and batteries. If necessary, the system will provide specific information on the status, either locally on a keypad or by representing it graphically at the control centre of the service provider using an IP or GSM network. By using the optional PC-based graphical software, the luminaire status information can be linked with floor plans showing the alarm locations.

Q Will this system make its way into the Indian Market?

A India is an important market for us and we have installed this system in the companies including Big Indian banks, Oil and Gas company, various hospitals, government hostels and HQ of IT companies, state parliaments etc. ■

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Light + Building 2018

A success story

Light + Building, the world's biggest event for lighting, electrical technology as well as home and building automation ended on 23rd March 2016, after setting new records. Growth was recorded in all important indices like the number of visitors, the number of exhibitors and the area occupied...



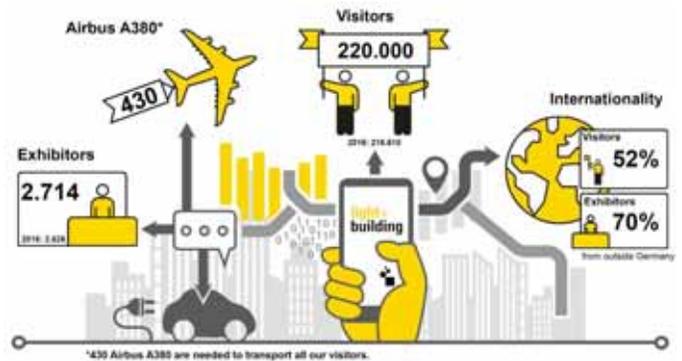
Full Range Supplier (Messe Frankfurt GmbH / Petra Welzel)

Light + Building is the world's leading event for the sector – and impressive demonstration of this was given yet again by the latest edition of the fair in Frankfurt am Main from 18 to 23 March 2018. A total of 2,714 exhibitors (2016: 2,626 as per FKM certified) from 55 countries launched their latest products onto the world market. Altogether, more than 220,000 trade visitors (2016: 216,610 as per FKM certified) from 177 countries made their way to Frankfurt Fair and Exhibition Centre to discover the latest products, solutions and trends offered in the fields of lighting, electrical engineering and home and building automation.

“Over the last six days, Light + Building presented a plethora of innovations. Everyone involved – exhibitors, partners and visitors – were delighted with the fair and this positive mood was prevalent in all halls. The upswing in the sector continues”, said Wolfgang Marzin, President and Chief Executive Officer (CEO) of Messe Frankfurt, summarising the fair.

The level of internationality rose again in comparison with the previous edition of the fair: 70 % (2016: 67 %) of exhibitors and 52 % (2016: 49 %) of visitors came from abroad. The biggest visitor nations after Germany include

Light + Building in figures



China, Italy, the Netherlands, France, the United Kingdom, Switzerland and Belgium. Large increases in visitor numbers were registered from countries such as the Russian Federation, India, Finland, Korea and Ukraine. There was also a significant increase in the number of attendees from Kazakhstan, Angola and Namibia.

All participants gave the fair top marks for quality. Thus, at over 80 %, the overall level of satisfaction remains very high. 90 % of exhibitors said they considered the economic outlook to be good. In the case of German exhibitors, no less



Asia Selection (Messe Frankfurt GmbH / Petra Welzel)



Decorative luminaire Modern Design
(Messe Frankfurt GmbH / Petra Welzel)

than 94 % said they think the outlook is bright. The overall level of satisfaction on the visitor side is even higher and once again reached 97 %.

Summaries from the sector

Michael Ziesemer, President of the German Electrical and Electronic Manufacturers' Association (*Zentralverband Elektrotechnik- und Elektronikindustrie e.V. – ZVEI*): "The role to be played by intelligently connected devices and systems in residential and functional buildings and how they contribute to greater safety, security, convenience and energy efficiency was to be seen clearly at this year's Light + Building. Digitalisation was the all-embracing subject, together with the resulting potential for new services and business models.

Light + Building 2018 came up to the high expectations of the ZVEI exhibitors."

Lothar Hellmann, President of the German Central Association of Electrical and Information Technology Contractors (*Zentralverband der Deutschen Elektro- und Informationstechnischen Handwerke –ZVEH*): "Light + Building not only fulfilled our high expectations. It exceeded



Decorative luminaire classic
(Messe Frankfurt GmbH / Petra Welzel)



Intelligent Greenhouse 'Plantcube'
(Messe Frankfurt GmbH / Pietro Sutera)

them. Nowhere else are more innovations and impulses for our sector to be found in this quality and density. Moreover, this year's motto, 'connected – secure – convenient', fitted perfectly with the most important markets for the electrical-engineering trade. And, with our special show, 'Smart Living in the E-House', we offered an ideal example of what is possible today in terms of building connectivity, systems integration and energy management – for more safety, security, convenience and energy efficiency."

A highly successful Intersec Forum 2018 brings together 650 experts from the security and building-services technology sectors

The participants of the 3rd Intersec Forum in Frankfurt am Main were in the right place at the right time to tackle future-oriented topics. The Conference for Networked Security Technology ended today (23 March) after welcoming 650 participants and generating a great echo from the industry and the building-services and security technology sectors.

Virtually all participants (94 %) were satisfied with the event and three quarters of them said they intend to visit the 4th Intersec Forum in March 2019. The 650 conference participants came from Germany and other European countries. Last year's two-day Intersec Forum attracted 180 specialists to Frankfurt.

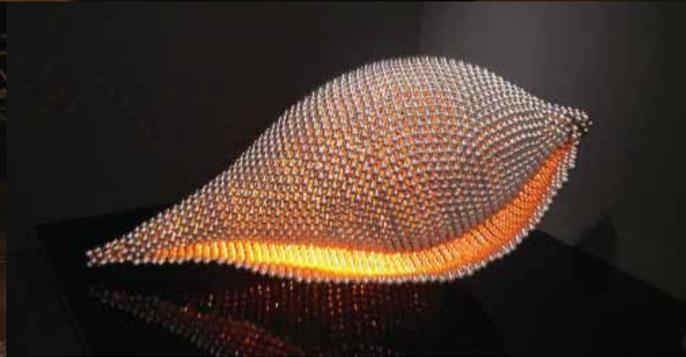
Around 240,000 visitors thrilled by Luminale in Frankfurt and Offenbach

Held concurrently with Light + Building, this year's Luminale, Biennale for Lighting Art and Urban Design, was characterised by a new concept with 149 projects, light installations, performances and discussions in five categories – ART, COMMUNITY, STUDY, SOLUTIONS and BETTER CITY – on the programme. Around 240,000 visitors came to the venues in Frankfurt and Offenbach. Particularly popular was the Light Walk in Frankfurt city centre. The ninth edition of the festival was coupled with a debate on urban challenges in the 21st century.

The next Light + Building will be held in Frankfurt am Main from 8 to 13 March 2020. ■



Lighting India curates its Light+ Building 2018 experience...



Spectacular Response to HKTDC Spring Lighting Fair

The four-day fair attracted more than 20,500 buyers from 114 countries and regions like the United States, Chinese Mainland, Taiwan, India, Russia, Malaysia, Singapore and Indonesia...



The fair attracted more than 20,500 buyers from 114 countries.

The tenth Hong Kong International Lighting Fair (Spring Edition), organised by the Hong Kong Trade Development Council (HKTDC) attracted more than 1,350 exhibitors, showcasing the latest lighting products and solutions to global buyers at the Hong Kong Convention and Exhibition Centre.

The four-day fair (6-9 April) attracted more than 20,500 buyers from 114 countries and regions like the United States, Chinese Mainland, Taiwan, India, Russia, Malaysia, Singapore and Indonesia. The fair, which primarily showcased outdoor lighting, advertising, smart lighting and industrial lighting introduced new zones like horticultural lighting, residential lighting, technical lighting and urban & architectural lighting this year.

The Hall of Aurora unveiled the most attractive and eye catching high-quality lighting fixtures, trendy lighting products and solutions from the top brands around the globe.

HKTDC Deputy Executive Director Benjamin Chau, said, "In response to the market trend, the Smart Lighting & Solutions Zone returned to the fair to showcase to global buyers the latest smart and remote-control lighting systems, accessories and fixtures. The topic of smart lighting was also covered in the seminars and forums held during the fair to help Hong Kong companies better grasp the latest

developments in smart lighting technology."

Like every year, this year too enlightening seminars were organised focusing on the latest industry trends. The Asian Lighting Forum, co-organised with the Hong Kong Electronics & Technologies Associations and Hong Kong Institution of Engineers - Electronics Division covered the topics Smart Lighting, Connected Lighting, IoT and Lighting Outlook.

Industry stalwarts from Bluetooth, Microsoft, Highways Department of Hong Kong, Osram Lighting Solutions, CREE, DEKRA and Philips gave insightful presentations on Bluetooth Mesh - smart lighting as a platform, IoT Trend in Smart Lighting, Smart City and Smart Lighting, Wi-fi Approach in Smart City, Future of LED Lighting etc.

At another seminar on Artificial Intelligence and Smart Lighting, experts from Zigbee Alliance, Alibaba AI Labs, iFLYTEK, JD Smart, ZTE, Tuya Smart and YEELIGHT discussed ways of Artificial Intelligence's role in enhancing smart lighting.

The HKTDC commissioned an independent on-site survey during the fair, interviewing more than 350 exhibitors and buyers about their views on industry prospects. The survey found that the industry is cautiously optimistic about the lighting market in 2018. Fifty-five per cent of respondents anticipate overall sales this year will increase, while 36 per cent expect them to remain unchanged. Forty-six per cent of respondents predict product prices will go up, while 45 per cent believe they will remain unchanged. The industry is most optimistic about the prospect of two emerging markets -



Overseas journalists interacting with the exhibitors during Media Breakfast Meeting.



Exhibitors showcasing the latest lighting products and solutions.



Russia and Latin America, followed by Western Europe, India, South Africa and the Chinese mainland.

TCL is a leading manufacturer of outdoor and indoor lighting products on the Chinese mainland. Jeffrey Guan, Director, Overseas Marketing Centre, Huizhou TCL Lighting Appliance Co Ltd, Chinese Mainland, stated, "We have been participating in the Spring Lighting Fair since many years because it is a professional trade fair attracting buyers from around the globe. Our main goal is to expand our OBM and ODM business with Asia and Europe being our target markets."

Established in 2014, Tuya Smart is a subsidiary company of Tuya Global. As an artificial intelligence (AI) and Internet of



Innovative products on display.



One of the exhibitors updating visitors about the products showcased.

Things (IoT) platform, Tuya Smart mainly provides smart solutions helping corporate customers to upgrade their traditional products to smart ones. While talking about the visitors' response, Bruce Chen, Product Manager, Tuya Global Inc., the US, informed, "HKTDC is our strategic partner for our company. We have showcased Wi-Fi enabled smart lighting and Bluetooth Mesh. Till now, we have connected with buyers from Australia, Canada, the Chinese Mainland, Hong Kong, India, the Middle East and the US. Many of them have expressed their interest in cooperating with our company." ■



Exhibitors unveiling the high-quality lighting fixtures, trendy lighting products and solutions.



COLLUMINA 's visit by our team was due to an accidental extension of trip to Cologne from Light + Building 18. Our team got bumped into this interesting event that happens to be an exhibition project in public space and in selected museums of the city of Cologne. This year it was held from 22nd to 24th March 2018.

The COLLUMINA project is a network of initiatives, institutions and companies that are jointly committed to a new exhibition format for contemporary art in Cologne's urban space. Dr. Ralf Seippel, art historian, curator and gallery owner, has been successfully managing the Seippel Gallery for 25 years.

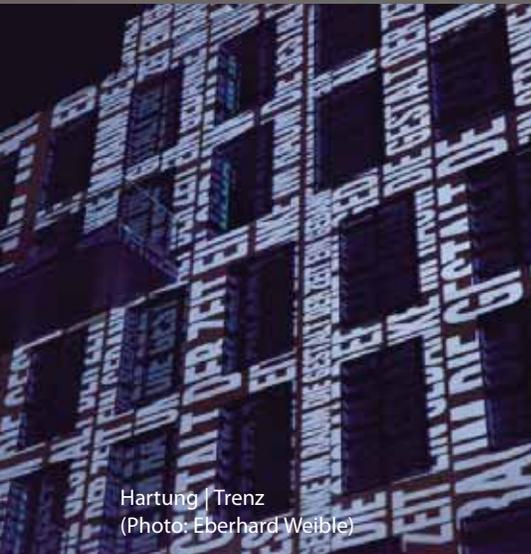
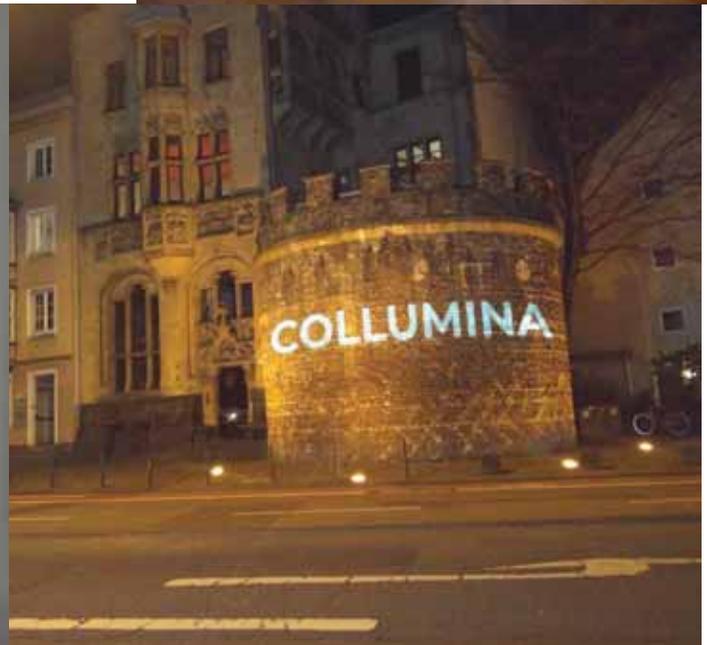
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Cuppetelli and Mendoza
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Guangzhou International Lighting Exhibition 2018 to begin from June 9

The 'THINKLIGHT: Embracing Changes' sharing programme launches with insights from the industry welcomed. Over 2,600 exhibitors select Guangzhou International Lighting Exhibition (GILE) as their platform of choice.



A still from GILE 2017

The global lighting and LED industry is gearing up for one of their key trade fairs of the year in China. Industry peers converge on Guangzhou each year to do business, learn more about new market trends, and to look for inspiration to make the next breakthroughs in lighting technology and design. The 23rd edition of Guangzhou International Lighting Exhibition returns from 9 – 12 June 2018 at the China Import and Export Fair Complex, Guangzhou, China. With more than 2,600 exhibitors from around the world already confirmed to join, this year's fair promises to be one of the largest editions to date.

More than just a fair of booths and pavilions, Guangzhou International Lighting Exhibition organises a comprehensive concurrent event programme to bring the best and brightest in the industry to the show. This year's event programme – THINKLIGHT: Embracing Changes – will be developed with the help of a sharing programme that has been launched in advance to collect insights from the industry.

Exhibitors, visitors and industry insiders are welcomed to share their thoughts on current changes or future trends in the industry with the fair organisers. This feedback will guide the content of the concurrent event programme to ensure that every speaker and presentation during the four-day show is as constructive as possible. The changing dynamics of the

industry will be on display throughout the exhibition. Demonstrating intelligent technologies that revolve around digitalisation and the latest design trends, more than 2,600 exhibitors have already been confirmed. Some of the key themes to look out for around the exhibition include:

Smart solutions

The lighting industry is pinning its future on connected lighting and IoT. The 2018 fair will be a haven of smart lighting solutions including lighting with sensor integration, built-in wireless connectivity and colour tuning capabilities. This type of lighting will perform beyond mere illumination and will function to react to human activity. Ideal locations for such lighting is found in offices, homes and retail shops, helping to improve workplace efficiency and customer experience.

Outdoor lighting is a crucial partner in smart cities. Smart street lighting exhibitors will showcase smart poles that are able to perform data collection and provide real-time city monitoring, functions increasingly requested by urban planners and local authorities. Some of the brands on show include HPWinner, Fonda Technology, Shanghai Feilo, Ecoel lighting, Huati, HEM lighting, Delos and LeiMai.

Human-centric lighting

Advances in LED technology and the proliferation of cost-effective LEDs have also enabled new lighting designs with a focus on the human-centric concept. By creating lighting designs that are able to adjust their colour temperature and intensity at different times of the day, lighting is better able to match the natural circadian rhythm of human activity. Some of the exhibitors presenting these solutions include Dilux, LEDVANCE, Magic Lighting, Wellmax, Sparta, Shanghai Arex Electronics and Konka.

Commenting on these significant changes for the industry, Ms Wong added: "The rising trend of the smart city and smart building concepts utilising data analytics is revolutionising the way in which the lighting industry operates. We are glad to see these changes bring with them the possibility to introduce a renewed energy and strength to the industry. We will continue to cultivate the fair as a platform to help industry players navigate the evolving business landscape and to unveil the industry's next game-changing breakthroughs." ■

For further information, please log on to: www.lightmessefrankfurt.com.cn

LED Expo

A sneak peek into the future of smart lighting innovations

IoT infused lights with wi-fi controls, solar street lights, LED solar lamps, all on display from 10-12 May 2018, Mumbai



A still from LED EXPO 2017

As the world is steering its way to LEDs, India is fast adopting LED technology as it is the perfect technological and economical solution for illuminating the public, commercial and private spaces. The latest trend in the lighting sectors are the IoT devices, that can be operated through wi-fi connectivity, bluetooth etc. which will take over the world by storm in the coming years. Bringing these latest trends in smart Lighting to the country, LED Expo 2018, India's renowned fair for the LED lighting, components and technologies is yet again returning in its 18th edition from 10 – 12 May 2018 at the Bombay Exhibition Centre trade grounds in Mumbai. Organised by Messe Frankfurt Trade Fairs India Pvt Ltd, the show is regarded as the most influential event for the business in LED technology.

Raj Manek, Executive Director and Board Member, Messe Frankfurt Asia Holding Ltd shared: "LED Expo as a brand has seen a steady growth with increasing number of national and international participation in every edition. Now in its 18th edition, this year's Mumbai edition will bring in better and more advanced innovations like devices using IoT, solar lighting and smart lighting to the Indian market. Continuing its position as the country's foremost platform taking charge of the LED transition we are confident of doing our bit in creating awareness, leading to an energy efficient country."

Every year, the industry experiences new concepts and

ideas at the LED Expo. The 18th edition of LED Expo has recognised the industry potential of smart lights as technology of the future and focuses on bringing the most innovative and energy efficient devices to the show floor. LED Expo 2018 Mumbai will see a huge selection of IoT smart lighting solutions to suit the future requirements of the industry. Innovations like smart lights with wi-fi controls, solar street lights, LED solar lamps, solar home light systems, and many more, will attract the audience and put a visual display of all the new concepts and technologies which will soon be available in the markets.

The annual LED Summit that happens on the side lines of LED Expo will see discussion by eminent speakers on 'Smart Solutions for Future Lighting'. The summit is running in its 6th edition and brings together participants representing the entire cross-section and all stake-holders of the industry at a common platform to facilitate business and for discussing, networking and sharing business insights and best practices within the industry.

LED Expo 2018 is no different with over 200 exhibitors showcasing their latest price competitive LED solutions for the Indian market. Besides India, exhibitors from countries such as China, Denmark, Hong Kong, Korea, Taiwan will be present at the three day fair which opens next month. Top international companies and OEM groups like ATC, Changi Lighting, Light Tapes LLP, OEM Systems, Range Lighting, Sigma, SM Solar, S R Electro, Swingtel will be participating this year indicating significant increase in international participation and growing interest of Asian manufacturers in the Indian market. ■

For more information about the event, please visit www.theledexpo.com



Exhibitor's Stall

LG OLED enhances 'Baskin Robbins Brown'

LG Display Co., Ltd. is a well known innovator of display technologies, including thin-film transistor liquid crystal (TFT-LCD) and OLED displays, as well as a global pioneer in OLED lighting. It produces a wide range of OLED light panels for the automotive and interior design sectors. Flexible and Rigid LG OLED light panels have been installed in Baskin Robbins Brown Store at Seoul, Korea.

On September 1st, 2017, SPC Group, Korea's largest food company opened 'Baskin Robbins Brown' in Seoul Korea. 'Brown' is a premium rendition of the Baskin Robbins franchise, offering a variety of food and beverages. Most notable is their specialty ice-cream that comes in one hundred flavours.

In order to instil the sense of premium into their new brand launch, SPC Group paid attention to every detail, specifically in lighting. OLEDs were perfect in obtaining their two objectives: to create unique aesthetics while minimising the light's effects on their food products.

Let's find out where LG OLED light panels are installed in the store and how they provide benefits to staffs and customers.

Where in the store?

SPC Group selected LG OLED light panels in the size of 300x300mm, and installed a combination of both flexible and rigid type panels into the centre of the ceiling, creating a visual focal point for the store. At the same time, the OLED light itself provides a very natural illumination. This helps reduce the optical fatigue of the staff and helps them stay alert. From the perspective of the customers, they are able to see the detailed colours and texture of the hundred different ice-cream flavours

Why LG OLED light?

One of the most outstanding characteristics of LG OLED light panels is that it is a 'low heat' lighting technology. This feature makes LG OLED light panels a perfect match in an ice-cream store. Especially in the Baskin Robbins Brown store, even though the ice-cream is arranged directly under the LG



OLED light panels, it does not receive any negative effects from the light.

Moreover, flexible LG OLED light panels, installed at the each end of the ceiling lights, enhance the atmosphere of the premium store with a unique and attractive design. Customers can relax and spend their time with comfort and joy.

These special characteristics of LG OLED light panels provide massive benefits to both store and customers. If you have a chance to visit Korea, try to visit the Baskin Robbins Brown store and enjoy LG OLED light and some delicious desserts.

Also, LG OLED light is always looking forward to expanding projects around the world. Therefore, an opportunity to work with LG OLED light is always open. Do not hesitate to ask questions for projects or collaboration. ■



Enzo Panzeri

“Technology is now a dominant aspect of the lighting sector”

One of the most important added values of **Panzeri** is represented by the heritage in terms of tradition and craftsmanship inherited in 70 years of history. The second generation entrepreneur, **Enzo Panzeri**, talks to **Lighting India** about the history lived and carrying the legacy forward with the ever-changing technology.

I believe ‘Panzeri’ has been in the market for the longest period, we would like to know about the company evolution?

In 1947 our founder Carlo Panzeri, an entrepreneur with great experience in the technical and engineering sectors, created in 1947 a company specialised in the production of lamps components. Since the 1990s, the second generation has been leading the company: Norberto,

myself and Simonetta Panzeri. Norberto’s son Federico Panzeri has been Export Manager since 2013. After seventy years, our family company is a consolidated reality in the almost zero-kilometer production of products for decorative and architectural lighting. This is confirmed by the growing trend in recent years and the positive results in 2017 too.

Could you tell us about your development in the product category from the beginnings up to now?

Our own lamps and chandeliers of side by side with those of other brands: this was our winning formula in the during our first decades of life. With the arrival of Carlo Panzeri's children in the company during the 90s, production was modernised and gradually opened up to foreign markets. Shortly after 2000 we created our own Research and Development department, we introduced laser cutting and since then we have gradually converted our lamps to LED lighting. Our high point arrived when we became a decidedly international company and with the success from both sales and Design points of view of products presented in 2015 such as Rings and Jackie.

What were the ebb and flow faced by the business?

Over time the company has optimised all its work flows, with staff working in departments with specific work Teams which actively collaborate in assisting the client in each stage of the project. From client support in product choice to the production and carrying out of the order to post sales assistance, Panzeri stands out for quality and professionalism.

How do you perceive the current market (Lighting)?

Technology is now a dominant aspect of the lighting sector. The digital revolution, which started with the arrival of LED lighting now involves lighting not just in homes but also in the workplace and the streets.

Technology is now a dominant aspect of the lighting sector. The digital revolution which started with the arrival of LED lighting now involves lighting not just in homes but also in the workplace and the streets.

Could you tell us about the business before and after inheritance?

Our market used to be mainly 'just' local, and then national. Things changed enormously with globalisation, the Made in Italy brand is very popular abroad in the lighting sector too and new horizons opened up which we couldn't have imagined before. Our exports now account for almost half of our revenue (49%) and we have a branch in Germany, in Munich, which looks after one of the most important European countries as regards the lighting market. We now export to more than 60 countries.



L2R: Norberto, Simonetta and Enzo Panzeri

What are your insights about into the future of your business (lighting) into this market (current scenario)?

We can no longer stop at producing good lamps. We need to think about how to place them in a world of devices which are all interconnected among themselves. We need to equip ourselves and evolve taking in User Experience, through software and smartphone apps that allow people and objects to interact with lighting fixtures. We've already taken steps in this direction with a version of the table lamp Jackie for the Internet of Things, the centrepiece of an Office Automation system called OTOMO.

How has the lighting market changed over the period of time since the company 's inception?

The lighting market has changed immensely since 1947, when the company was founded. Panzeri started out as producer of mechanical components for other lighting companies. Through the years the desire to have our own line of products grew to the point that what was initially just a dream became reality. The lighting market has changed enormously since the first collections. Globalisation has influenced many dynamics, in both sales and design. For example design now has to satisfy the standards of many different countries, both in Europe and outside it. Our contacts now come from more than 60 countries around the world.

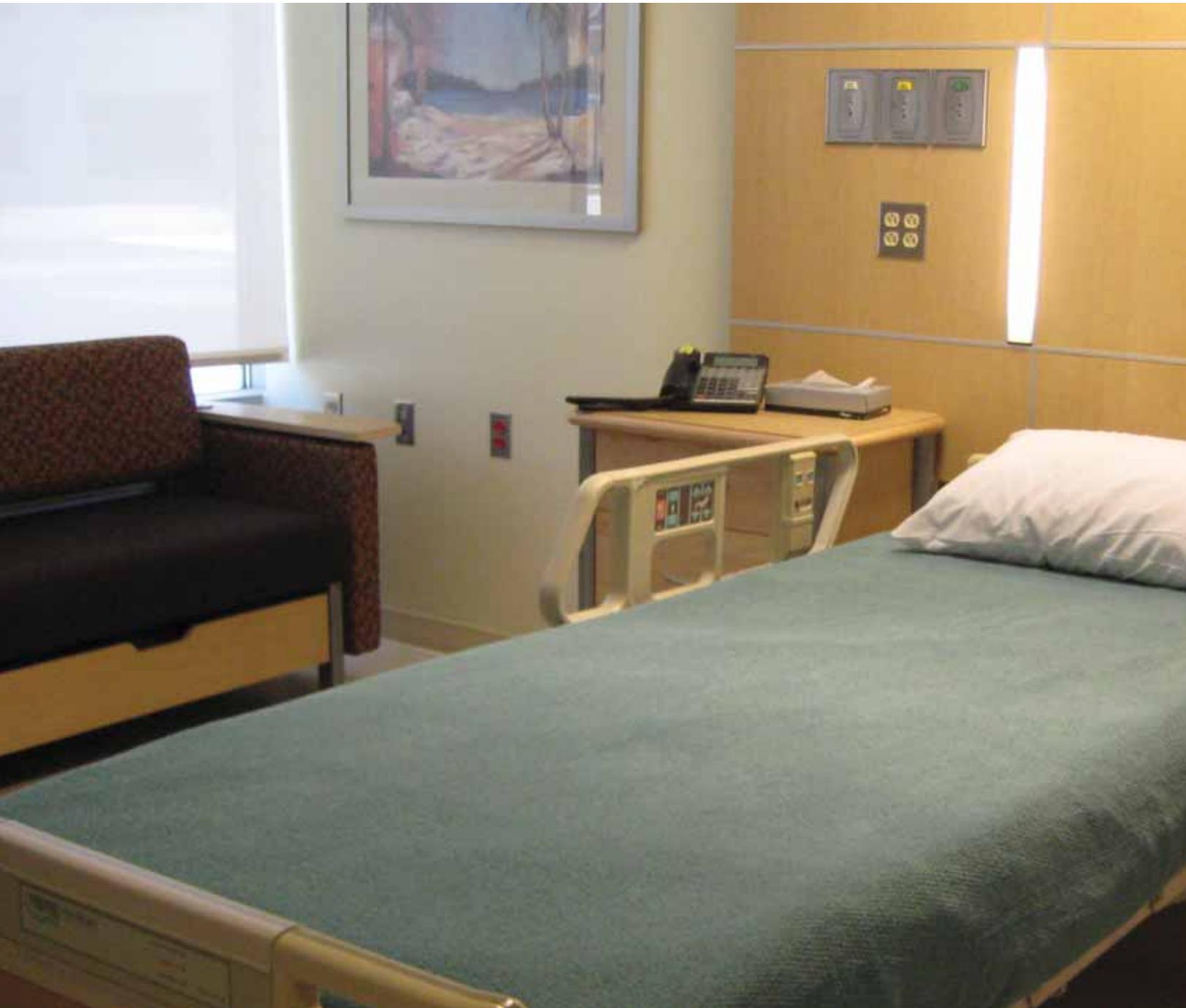
Any piece of advice that you would like to give to the current entrepreneurs in the industry?

Our advice to other entrepreneurs is to keep your objectives clear and never compromise. ■

Healthcare Lighting

Create Warmth for Your Patients and Keep Operating Costs Minimal

The importance of lighting often goes beyond the practical, especially in locations such as healthcare facilities.



Lighting is of critical importance in hospitals. In my previous article I had covered in brief the importance of Human Centric lighting in Healthcare. Elaborating on that in a more holistic manner it is necessary to understand that an adequate level of lighting is essential for Hospitals for even basic tasks are to be carried out. Hope you enjoy reading it. We shall be glad to assist you with further information for projects.

Not only are the healthcare locations often open long hours, but they also need to promote a sense of pleasantness, calmness, and wellbeing. Of course, the restricted areas which are essentially critical task areas need adequate lighting to ensure smooth operations often very critical and taking long hours. The quality of the visual environment has a positive effect on the occupant's feeling of well-being and in the case of hospitals and healthcare buildings this can affect staff performance and patient recovery. Furthermore,

another important factor is substantial savings is possible if energy efficient, effectively controlled lamps and luminaries are installed, with maintenance being considered at the design stage itself.

The importance of lighting often goes beyond the practical, especially in locations such as healthcare facilities.

Key Considerations

The work undertaken in a healthcare location can sometimes vary day to day, making greater insights into your lighting essential for optimal conditions. Some things to consider, include:

- Your hours – do your hours vary and/or are you a 24 hour or emergency location?
- How will your lighting requirements change between laboratories / patient rooms/surgical sites/outdoor areas, etc.?
- How will you create a welcoming first impression?
- How can lighting assist with directions and location information?

Carefully designed lighting can transform the appearance of a space, making it attractive, welcoming and either restful or stimulating depending on the effect created. It can enhance the architectural appearance of the space and contribute to orientation and wayfinding. For example, harsh lighting has been identified as one of a series of stressors that can lead to episodes of delirium in a critical care unit. In the neonatal ward, appropriate lighting can result in improved development, development of sleep patterns and reduced retinal damage. The elderly and partially sighted particularly benefit from good quality, low-glare lighting

Daylight and powered light integration

Both daylight and electrically powered light play a part here. Daylight infusion inside the spaces needs careful consideration, because it needs to be addressed at the initial building design stage itself.

In fact, even the underground car parking area of hospitals which does not receive direct light from the sky, needs careful light planning to avoid unfriendly start to a hospital visit. Light from the sky is particularly important in hospitals. It gives excellent colour rendering making many clinical tasks easier. Integration of electric light with daylight is essential for optimum energy efficiency. This will mean assessing the daylighting performance and ensuring that electric lights can be controlled to complement daylight as and when required in a user-friendly way.

The diurnal variation in daylight can help patients (particularly those who are in hospital for a long time) maintain their body clocks. As Daylight is also constantly changing as the sun moves round the sky and as clouds form and move about, the short-term variation gives variety and interest helping in early recovery of the patient. Along with day light view out is also particularly important for people in hospitals (staff and visitors as well as patients). Nursing staff



Photo Credit: commons.wikimedia.org

work long hours in high-stress conditions and are often deprived of natural daylight, which is the main driver regulating our circadian rhythm. These caregivers need their circadian rhythm regulated just as much as their patients do. Providing right kind of light reduces feelings of isolation and claustrophobia. It provides contact with the outside world and can add interest to the environment, particularly if things are happening outdoors.

Lighting Designing

The lighting of hospital tasks is important as is the lit appearance of the interior. There can be a conflict of requirements. On the one hand, there are high technology and critical precision-oriented tasks, some of which can have life or death implications and on the other hand there are diverse kind of patients with ailments being treated towards curing and caring for them and bringing them relief and happiness. Also, obvious aim is using energy-efficient lighting equipment, but it must be balanced by visual performance requirements also. It also means only applying the lighting required for both the task and appearance, which does not mean flooding the whole areas of a hospital space with light that is unnecessary. The lighting installation needs to be designed to not only provide the lighting required, but also control it to the best effect. Examples of this are switching lighting off when there is sufficient daylight or when rooms, or areas, are not occupied such as toilets and bathrooms. This will require the lighting circuits to be planned. For example, zoning lighting circuits relative to the windows so that those nearest the window can be switched off while those furthest from the windows can be left on as necessary. Positioning and labelling of switches can help with this but in some cases automatic controls might be appropriate; however, for hospitals the designer must be sure that these will not interfere with the hospital's operation.

The importance of each area from lighting context will thus vary as will the solutions depending on application. It is impossible to categorise in detail the elements of lighting design because of the number of variables, which makes it important to commission an experienced lighting consultant. Some of the most important areas in a hospital to consider while designing of the required lighting are:

- Entrance Area
- Reception
- Waiting Area
- Circulation Areas
- Day Care Areas
- Bedded Care Areas
- Nurses Workstations
- Medicine & Medical Equipment Store
- Pharmacy
- Examination Rooms
- Imaging Rooms
- Surgical Rooms
- Special Clinical Task Areas
- Bathroom & Toilet facilities – Especially for the patients

admitted

- Kitchen of the F&B facility inside the hospital as well as that of staff cafeteria

A further element of lighting appearance is concerned with the colour appearance of the light. It is preferable to use a lamp colour that blends reasonably well with daylight but does not appear too cool at night. For this, a lamp with a CCT of 4000 Kelvins is recommended

Insufficient illumination, glare or excessive differences of brightness within the field of view can cause considerable discomfort to those who must perform a task which requires visual concentration. The muscles of the eye, which regulate the pupil opening and which are responsible for accommodation and convergence of the eye, become tired and fatigued. Although the eye is highly durable, it is an organ that can easily become strained by adverse conditions.

Lighting Cost

Like any other hospital building services, lighting has costs attached to it. They must be seen in context. The total capital cost of the electric lighting installation will be tiny compared with the cost of other building services and even smaller when compared with the total cost of the building. But unfortunately, lighting equipment is installed towards the end of a construction plan when cost savings are often being sought. Pressure should be avoided to reduce the quality of the installation. If the quality of the lighting installation is reduced, this could have detrimental effects on the operating costs. The life of a lighting installation will be ten years at least and often much longer. Therefore, if the installation uses more energy than it needs, because of less than ideal equipment, the running costs will be high. This will usually cancel out the apparent savings made through reduced equipment costs. The same thing applies to a costly maintenance programme, either through poor equipment that has a short life or through the need for complicated or difficult maintenance work. This means that the costs must be assessed through a life-cycle costing investigation. It is important to adopt such an overall approach even when capital and operating costs are borne by two different organisations or budgets. The remaining issue to be considered regarding lighting costs is that if good lighting is not provided then the staff will not be able to perform accurately and efficiently. Also, if the quality of the internal environment is compromised through poor lighting, the recovery rate of patients could get worse. Both will be considerably costlier in the context of the reputation of the hospital than the lighting – hence the necessity for a balanced approach where all the elements are considered. ■



Sudip Mukherjee

Business Head
Inforel Innovation & Research Pvt. Ltd.
New Delhi

Access Fixtures launches new APTI LED Flood Light

Access Fixtures launches APTI LED profile, IP67-rated flood lights technology and commercial lighting rated life of 200,000 hours; the APTI LED arrays, easy mounting, 1,000-shipping. In efficiency, lumen output, flood lights offer impressive 115,680 lumens at an efficacy of

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With their efficiency, lumen output, and many customisation options, lighting your flood or area lighting project is a breeze with APTI. Explore the APTI family from Access Fixtures to ensure your project achieves the best light it requires. ■

Website: www.accessfixtures.com



flood light fixtures. This efficient, low-represent the latest in LED flood light design. Featuring an incredible L70 flood light offers intuitive modular hour salt-spray protection, and quick and easy customisation, the APTI LED performance, emitting up to 120 lumens per watt.

these fixtures provide you with the for your project. With such an option to mount your APTI flood light receive a terrific amount of landed specific beam spread? No problem. offering a range of over twenty spread options from wide to narrow for your project. Designed for easy die-cast aluminium APTI flood lights coatings are available in a range of

K-LITE Introduces LED Landscape - Redefined

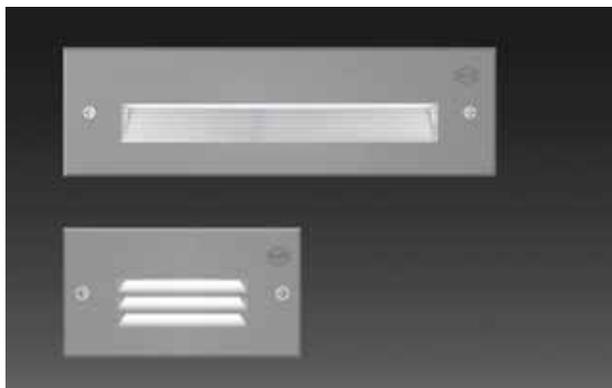
The Essence of lighting is one of the most important things in our lives. At K-Lite we are passionate about creating a distinctive atmosphere that improves the quality of life in the cities and towns by exploring the many potential facets of lighting that supports the wellbeing and safety of all.

Founded in 1977 in India, K-Lite has grown to be the leading manufacturer of outdoor luminaires and decorative poles. K-Lite's proven performance in the landscape segment is because of its ability to stylishly convey the identity of a space with a blend of efficiency and modularity to maximise the visual comfort that is best suited to each specific space.

Our Landscape range includes :

Linear Wall Washer, Up-Down Lighters, LED Strips/Neon flex, Promenade Lighting, Bollards, Under Water Lighting, Post top luminaires, Bulk Heads, Path finders, Polar lighting and newly added series of Facade Lighting. ■

Email: info@klite.in



NTL Lemnis launches energy efficient 'Pharox Flare Plus Flood Lights'

NTL Lemnis, a well known LED Lighting of flood lights to its energy efficient 'Pharox Flare Plus flood light'.

The Pharox Flare Plus flood light 40W, 80W, 120W, 160W. These very wide gap that existed in meeting energy efficient too.

The Pharox Flare Plus, in 40 W and various functions like high lighting, area areas such as airports and atriums. The Crane lighting, Light Towers, etc and Outdoor lighting applications, etc.

The Pharox Flare Plus flood lights are luminaires with a modular approach requirements. With four wattages and three beam spreads to select from, the Pharox Flare Plus flood lights are powerful luminaires to cater to various applications. Its robust construction using aluminium extrusion and a polycarbonate lens plate makes it a sturdy luminaire for outdoor applications as well.

The concept of Modularity and external driver in flood lights is a USP for each Pharox Flare Plus. Each module is of 40W, and therefore any incremental increase will mean larger number of modules, which are independent, leading to robustness and add a failsafe mechanism, wherein even in case of failure of one, the others will work. This makes it risk free and good for safety purposes. An external driver helps in better maintenance and therefore the flood-light offers a hassle free upkeep.

The Pharox Flare Plus flood light is available across North, West and South India at select distributors the MRP of Rs. 5200 for 40W, Rs. 10,400 for 80W, Rs.15,600 for 120W and Rs.20,800 for 160 W. ■

Website: www.pharoxglobal.com



Solutions Company, has added a range product portfolio, with the launch of

lights are available in four wattages: professional range floodlights will fill a optimal lighting requirements that were

80 W are general lights suitable for lighting, and indoor lighting, generally at 120 W and 160 W are more tuned for are therefore suited for Industrial and

elegantly & intelligently designed towards lighting design and its

Philips Lighting introduces LiFi

Philips Lighting is now offering Light Fidelity (LiFi), a technology in which high quality LED lighting provides a broadband Internet connection through light waves. As the lighting company for the Internet of Things, Philips Lighting is the first global lighting company to offer LiFi-enabled luminaires from its existing office lighting portfolio.

"LiFi has enormous potential for today's digital age and as the world's leading lighting company we are proud to pioneer new and innovative services for our customers," said Olivia Qiu, Chief Innovation Officer, Philips Lighting.

LiFi is a two-way, high-speed wireless technology similar to WiFi but uses light waves instead of radio waves to transmit data. Philips Lighting's office luminaires enabled with LiFi technology provide broadband connection with a speed of 30 Mb per second (Mb/s) without compromising lighting quality. With 30Mb/s a user can stream simultaneously several HD quality videos while having video calls.

Icade, the French real estate investment company, is piloting the ground-breaking technology in its smart office in La Defense, Paris. "LiFi has the potential to be a real game changer in offices. As the leader in our market we wanted to explore the possibilities of this technology for existing and future clients. We plan to showcase the technology in our smart office in La Defense, so aside from stable connectivity, light quality is crucial to us," said Emmanuelle Baboulin, Head of the Commercial Property Investment Division at Icade. ■

Website: www.lighting.philips.co.in

Why Philips LiFi luminaires

Light Fidelity (LiFi) is a two-way, high-speed wireless technology similar to WiFi but using light waves instead of radio waves to transmit data.

Ideal connectivity: -----

- Reliable network** (e.g. dense urban environments)
- Secure communication** (e.g. banks, government, military)
- New-gen technology** (e.g. underwater, underground)
- Alternative solution** (e.g. hospitals, aircraft, schools)

Data reception via USB access key/dongle

Double benefits:
LiFi-enabled luminaires, without compromising light quality or integration with control systems

30 Mbs data, secure and reliable broadband
Wide coverage zone

>80% electricity savings*

Alternative to WiFi
10,000x WiFi bandwidth

*when compared to conventional lighting

Event Calendar

LED Expo Mumbai 2018

Venue: Bombay Convention & Exhibition Centre, Mumbai
Date: 10 - 12 May, 2018
Website: www.ledexpo-mumbai.com

PALM Expo India 2018

Venue: Bombay Exhibition Centre, Mumbai, India
Date: 31 May - 2 June, 2018
Website: www.palmexpo.in

Light India 2018

Venue: Pragati Maidan, New Delhi
Date: 11-13 October, 2018
Website: www.light-india.in

LED Expo New Delhi 2018

Venue: Pragati Maidan, New Delhi
Date: 6-8 December, 2018
Website: www.ledexpo-delhi.com

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(LxWxH): 360 x 30 x 21 [mm]

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(LxWxH): 360 x 39 x 21 [mm]



(LxWxH): 360 x 30 x 21 [mm]



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BAG NCD (Non-Isolated) Series 400mA - 800 mA - 70W - 100W 4 Products



(LxWxH): 280 x 30 x 21 [mm]



(LxWxH): 280 x 30 x 21 [mm]

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