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PUBLISHER'S LETTER

From incandescent light bulbs in 1854 – to CFL in 1980s – to LED lighting in 1990s – the lighting industry has witnessed remarkable transformation during the past one and a half centuries. Further, LEDs have transformed lighting from analog to digital, enabling users to remotely control and monitor them. The digital capability of LEDs brings LED lighting and information technology together to take light beyond illumination.

Over the last few years, the LED lighting industry in India has come of age owing to focus on energy efficiency. This time, we throw light on the opportunities for India LED business beyond 2020.

The facade of a building is an important aspect from the design standpoint as it sets the tone for the rest of the building. Facade creates an exciting look and feel for a building, with attractive architectural LED lighting. Ashish Batra explores the techniques and benefits behind efficient and effective facade lighting.

Lighting plays an important role in healthcare, improving both the patient experience and the staff's performance in terms of providing the required level of care. The right light at the right time in the right place is considered as the most critical element in healthcare facilities. Here, Dr. Amardeep M. Dugar explains the lighting designing components of India's first USGBC LEED Platinum-certified hospital in Chennai, Tamil Nadu – MGM Healthcare.

Lighting is not just lighting anymore. Today, apart from illuminating a space, lighting has become more energy efficient and intelligent, opening up a whole new range of applications such as Li-Fi (light fidelity).

However, with LEDs not being standalone light source, call for knowledge or with skill sets in thermal, optical and mechanical design, and electronics or electrical engineering, software etc, observes Lighting Designer, Educator and Consultant Anil Valia. He believes, even in sales or marketing of LED luminaires, sales people with no additional skills as needed today seem to be non-performing assets. He suggests, enough emphasis should be given on skill development that can improve the ecosystem.

Hope you'll enjoy reading this issue as always. Do send in your comments to me at miyer@charypublications.in

Mahadevan

Publisher & Editor-In-Chief

Directors

Pravita Iyer
Mahadevan Iyer

Publisher & Editor-In-Chief

Mahadevan Iyer
miyer@charypublications.in

Group Editor

Subhajit Roy
subhajit@charypublications.in

Editorial Co-ordinator

Nafisa Kaisar
nafisa@charypublications.in

Director - Advertisement

Pravita Iyer
pravita@charypublications.in

Advertising Manager

Nafisa Kaisar
nafisa@charypublications.in

Design

Sachin Parbalkar
Jebas Thangadurai

Subscription Department

Priyanka Alugade
sub@charypublications.in

Accounts Department

Dattakumar Barge
Bhakti Thakkar
accounts@charypublications.in

Digital Department

Ronak Parekh
dgmarketing@charypublications.in

Lighting India is also available online on www.lightingindia.in. For online enquiries contact at: dgmarketing@charypublications.in

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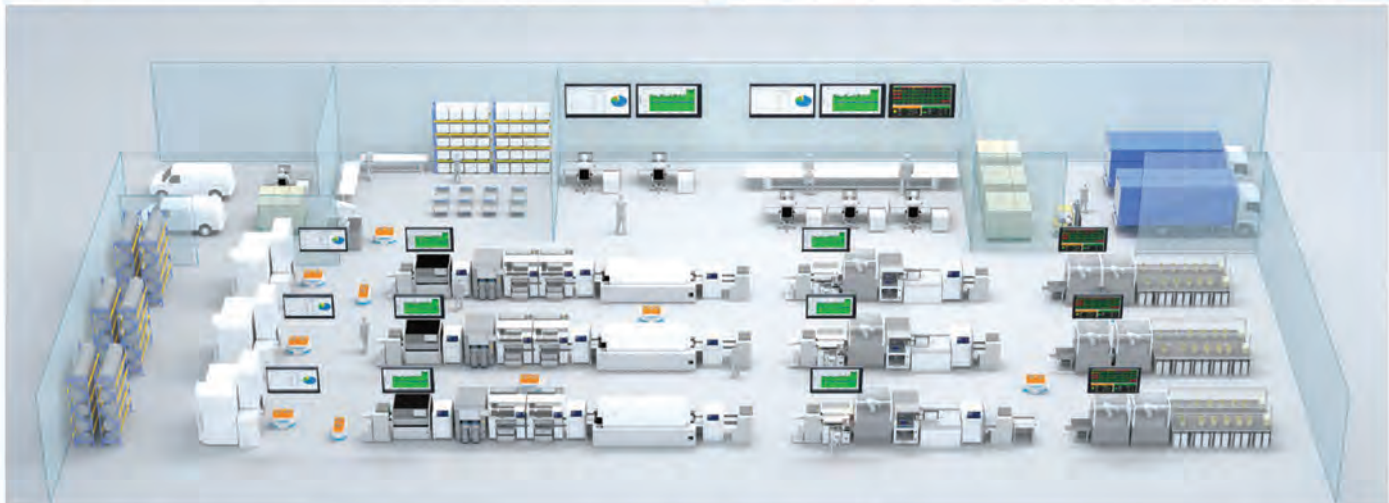
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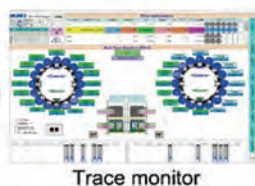
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Room 904-905, HaiLiang Building, No.22, Lane 118, ZhongJiang Rd. Shanghai, P.R.C.
Contact: Shanghai: +86-21-6236-8202, Shenzhen: +86-755-2668-8670

JUKI SMT ASIA CO.,LTD.

700/716 Moo 1, Amata Nakorn Industrial Estate, Phanthong, Phanthong District, Chonburi 20160 Thailand
TEL: +66-3846-5306 FAX: +66-3846-5305

JUKI India Pvt. Ltd (SMT Division)

B-220, Okhla Industrial Area Ph-1, New Delhi -110020
Contact: Delhi: +91-9971396921, Bangalore: +91-9901622887,
Mumbai: +91-9323619519
Email: smt@jukiindia.com / Web site: www.smtjukiindia.com

Signify to acquire Cooper Lighting

Signify announced that it has entered into a definitive agreement with Eaton to acquire Cooper Lighting Solutions for USD 1.4 billion in cash. Closing is subject to regulatory approvals and other customary conditions and is expected to take place in the first quarter of 2020.

Cooper Lighting Solutions, headquartered in Peachtree City, GA, United States, is a leading provider of professional lighting, lighting controls, and connected lighting. The business offers a large breadth of products and applications, both in the indoor and outdoor segments, sold under renowned brands in North America including Corelite, Halo, McGraw-Edison, Metalux. The company sells its lighting portfolio through a strong agent network and has direct relationships with retailers, distributors and other end-user customers. The business generated 2 USD 1.7 billion of sales in 2018, of which 84 per cent were LED-based, a reported EBITDA of USD 187 million and free cash flow of USD 143 million.

"Today's announcement confirms the strategic importance of the North American market for Signify. This acquisition will substantially strengthen our position in this attractive market," said Eric Rondolat, CEO of Signify. "We will join forces to further develop connected lighting and provide our customers with the highest level of service while optimising operational efficiencies."

"Together, the two businesses will be better positioned to benefit from the growing USD 12 billion professional lighting market in North America, driven by the continued conversion to LED and the increased demand for connected lighting systems and controls," a statement released by the company said. ■

Air France tests Li-Fi technology during a flight

On Wednesday, October 30th, Air France tested the very first flight equipped with Li-Fi (Light Fidelity) technology, developed by Latécoère on board the commercial flight AF6114 operated by Airbus A321 from Paris-Orly to Toulouse. As part of its commitment to researching new in-flight uses for its customers, Air France welcomed gamers, finalists in the Air France Trackmania Cup, developed by Ubisoft, who competed in the sky.



Air France and Latécoère are currently testing the ease with which this technology can be integrated and certified on commercial flights. The Latécoère Li-Fi infrastructure installed on 12 seats on the Air France Airbus A321 has many advantages. It generates: a completely stable multimedia data exchange at a very high speed and very low latency; and a reduction in the aircraft's weight and therefore its fuel consumption, due to replacing copper cables with fibre optic technology.

Antoine Laborde, Air France's Innovation Manager said, "We are very proud to be the first airline to launch a Li-Fi equipped aircraft and to organize an in-flight video game competition. This world first is the result of a great collaboration between Latécoère, Ubisoft and the Air France teams. I am convinced that this experience will pave the way for new in-flight entertainment experiences for our customers, especially with regards to gaming."

Yannick Assouad, CEO of Latécoère adds, "This first flight equipped with our Li-Fi technology is an important step in the roll-out of this technology in the aeronautical market. We are convinced that Li-Fi will revolutionize in-flight connectivity within the next 5 years." ■

Lighting industry converges at Shanghai International Lighting Fair to discuss city lighting developments

The Shanghai International Lighting Fair (SILF) successfully concluded as the sixth edition of the trade fair was held from 3 - 5 September at Shanghai New International Expo Centre (SNIEC). Exhibitors and buyers took full advantage of the high-level business opportunities on offer in Shanghai, while over 40 speakers contributed to a concurrent event programme that explored the latest progress and future trends of the city lighting sector.

Commenting on the successful conclusion of the sixth edition of the trade fair, Ms Lucia Wong, Deputy General Manager of Messe Frankfurt (Hong Kong) Co Ltd, said, "Shanghai International Lighting Fair once again gathered the lighting industry to discuss the latest developments in the industry while also providing the right platform for trade and business opportunities. The domestic city and urban lighting industry in China is progressing rapidly and conversations on the sustainability and technical infrastructure that will drive the development of the industry forward are essential. By converging different stakeholders of the industry together to share ideas, we are optimistic that such developments will benefit entire communities."

Shanghai International Lighting Fair converged many different sectors, from architects and lighting designers to city planners and technical engineers, to contribute and discuss a wide variety of topics at the concurrent event programme. The event programme successfully organised a series forum and witnessed more than 40 speakers and participants engage with the gathered audiences. ■

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Getac announces partnership with pureLiFi

Getac, a manufacturer of rugged tablets and PCs for military, manufacturing and automotive industries, has announced that it is working with the LiFi technology provider pureLiFi to evaluate the technology for design into future wireless devices.

LiFi enables data transmission via light rather than radio waves at high-speeds through small adjustments in the intensity. The result is a high-speed Internet connection that is more secure, reliable, and able to deliver bandwidth far beyond the capabilities of conventional wireless communications such as Wi-Fi.

For military, automotive, and manufacturing customers, security, safety and reliability are paramount to their operations. Getac ensures that they utilize the latest technologies to provide customers with solutions to overcome challenges and safeguard and improve productivity. LiFi is more secure and virtually interference-free compared to other wireless solutions. By introducing LiFi technology, Getac customers can take advantage of the security and reliability of a wired network with the flexibility of a wireless solution.

"Getac's partnership with pureLiFi will make us the pioneer in the rugged devices industry to tap on the potential of next-generation connectivity, strengthening our commitment to customers operating in extreme and challenging environments," said Amanda Ward, Director of EMEA Products and Solutions, Getac.

"In 2019, pureLiFi launched components for integration into mobile devices aligned with our strategy to provide LiFi for every device and every light," said Nikola Serafimovski, pureLiFi VP of Standardisation and Business Development. "Getac will be the first device company to put LiFi onto their product roadmap and deliver to their customers unprecedented security, reliability and bandwidth by doing so." ■

Christie laser projectors light up façade of Dandi Kutir

Christie HS Series 1DLP laser projectors deployed for a 3D projection mapping show on the façade of Dandi Kutir are mesmerising visitors with vivid and lifelike visuals that celebrate the life and works of Indian independence and civil rights leader, Mahatma Gandhi.



The 30-minute show, which features stunning projections using 16 Christie D20WU-HS laser projectors on the surface of the salt-mound-shaped museum, is the second largest permanent projection installation in India after the Statue of Unity – the tallest statue in the world, which also employs Christie projection technology for its nightly projection mapping show. It has been described as a fascinating showcase that pays tribute to the life, ideology and works of the late Indian leader dubbed "the father of the nation".

Since its inauguration by Indian Prime Minister Narendra Modi earlier this year, the show has become a huge attraction that draws thousands of visitors to the museum on a daily basis. The installation and commissioning of the show was jointly undertaken by Christie's trusted Indian partners, Bombay Electrical and Nolabel Immersive.

Amit Gupta, Managing Director, Nolabel Immersive, said, "Having used Christie visual solutions for various multimedia exhibits in the Dandi Kutir museum to great success, the museum decided that Christie's high-brightness laser projectors are best-suited to deliver the visuals required for this new light and sound musical."

The D20WU-HS was ultimately chosen as it has the best lumen-to-weight ratio – able to achieve the brightness needed for bold and colourful visuals with 20,600 ISO lumens, and yet weighing less than 100 lbs. (42 kg) for easy access and maintenance. ■

Connectivity brings artificial intelligence into buildings

The process of connecting the various building services with modern safety and security technology is entering the next phase: initial research projects and application platforms permit future-oriented forecasts for the benefits offered by smart-building and smart-city applications. For all experts from the field of technical building planning and construction, the 5th Intersec Forum – Conference for Connected Security Technology – will examine the future of safety and security technology in buildings.



As an important concern of manufacturers and users, connected safety and security technology will be a prominent aspect of Light + Building – the world's leading trade fair for lighting and building services technology – in March 2020. At Light+Building, leading companies covering the entire spectrum of building-services technology present, for example, emergency lighting in Hall 8 and building automation in Halls 9 and 11, as well as make contributions to 'Intersec Building', the international platform for connected safety and security technology in Hall 9.1.

The Intersec Forum is the main information interface at Intersec Building (8 to 13 March 2020), the international platform for connected safety and security technology at Light + Building 2020. ■



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Philips opens its 7th Smart Light Hub opens in Kolkata



Expanding its retail presence in West Bengal, Signify (formerly Philips Lighting), a global leader in lighting, inaugurated its 7th Philips Smart Light Hub in Kolkata. Encouraged by the growing consumer preference for smart home lighting solutions, the company has designed its latest store in a brand-new format focused on connected lighting solutions including Philips Hue. The store was inaugurated by Sumit Padmakar Joshi, CEO, Signify Innovations India Limited.

"Kolkata is fast emerging as one of the most promising markets for us in this region owing to a growing consumer base with evolving aesthetic tastes in lighting. We have launched our 7th Philips Smart Light Hub in the city to meet this growing demand. This exclusive store will offer a wide variety of home lighting solutions, with a strong focus on our Philips Hue connected lighting range," said Mr Joshi.

Addressing the growing demand and preference for connected lighting in this age of smart home assistants like Amazon Echo, Alexa and Google Home, the latest Philips Smart Light Hub launched in Kolkata is spread across an area of 2,000 square feet. It showcases an impressive display of world-class lighting products and concepts, including Philips Hue – the web-enabled LED home lighting system.

This is the latest addition to the company's 180-plus exclusive Philips Smart Light Hubs across the country. The latest Philips Smart Light Hub is located at Sector 5, Bidhannagar, Kolkata. ■

Osram Infrared LEDs make VR and AR applications even "more real"

Virtual (VR) and Augmented Reality (AR) applications will become more widespread in the coming years. They have long played a central role in areas far beyond classic gaming. Various global players have used these technologies for training purposes or integrated them firmly into their daily work processes. As these applications become part of our everyday lives, some users are developing feelings of discomfort and dizziness when the virtual and real perceptions do not match. Osram's new Firefly SFH 4030 and SFH 4060 help to prevent these side effects by enabling state-of-the-art eye-tracking solutions that provide a targeted point of reference, allowing users to safely immerse in other worlds.



Eye-tracking systems register the user's viewing angle and the movements of his or her eyes. The systems illuminate the eyes with infrared light and register the reflections with a camera sensor. Software then determines the exact position of the eyes and the viewing direction of the user to derive relevant information for the imaging elements of the system.

The Firefly SFH 4030 and SFH 4060 feature compact dimensions of only 1.0 mm x 0.325 mm. Thanks to their low height of only 0.55 mm, the side emitting components can be easily installed. A special feature is the black cap, which makes the two IREDs "invisible" when installed.

Customers can choose between the 940 nm version (SFH 4030) or the 850 nm version (SFH 4060), depending on the requirements of their target application. With the SFH 4060, customers benefit from the high sensitivity of the sensors in this wavelength range. On the other hand, the 940 nm version (SFH 4030) avoids the disturbing "red glow" effect, where users see a red light. ■

Light-on-demand for new Beijing airport

The newly opened Beijing Daxing International Airport is rightly regarded as a mega project and makes extensive use of indirect lighting. Tridonic supplied more than 5,000 drivers, intelligent lighting control and light-on-demand with daylight tracking.

The new ultra-modern airport is located south of the Chinese capital and resembles an oversize starfish from the air. Daxing is the first airport project in China in which DALI drivers and a light management system are integrated in the KNX building control system. More than 2,000 LCA one4all drivers from Tridonic help to provide appropriate dimmable lighting in the spacious interior of the new terminal building.

Around 3,000 further Premium drivers have been installed for the parking spaces. DALI drivers and the intelligent remote lighting control combine to ensure perfectly tailored illumination for the relaxation areas, reading areas and the restaurants. Daylight tracking improves the comfort of passengers still further. ■



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Sanjeev Nandan Sahai assumes charge as Secretary, Ministry of Power



Sanjeev Nandan Sahai

Sanjeev Nandan Sahai assumed charge as Secretary, Ministry of Power here. Prior to this, he was serving as the Special Secretary in the Ministry of Power. Sahai is a UT cadre IAS officer of 1986 batch. He has also served as Additional Secretary in the Ministry of Power from May, 2018 to July, 2019. Along with these Sahai has held several other important positions in the Union as well as state governments. These include DG (Additional Secretary equivalent) and

Additional Secretary in the Ministry of Commerce and Industry, Principal Secretary in the Home Department, Chairman and MD of Delhi Transport Corporation, Secretary-cum-Commissioner Transport for Delhi Government, Chairman of the Chandigarh Housing Board, Finance Secretary in the Government of NCT of Delhi, Home Secretary etc. Sanjeev Nandan Sahai has taken the charge as the Secretary, Ministry of Power in New Delhi on November 01. ■

Anil Kumar Gautam appointed as Director Finance of NTPC



Anil Kumar Gautam

Anil Kumar Gautam has taken over as Director Finance of NTPC. He is a graduate in commerce and a fellow member of the Institute of Cost Accountants of India. He is also a law graduate. He joined NTPC in the year 1984. He has over 34 years of rich experience in various aspects of finance

and accounts in power sector including resource mobilisation from domestic and international markets, long-term financial planning, taxation, budgeting, investment appraisals, investors services and regulatory affairs. He was also appointed as Chief Financial Officer w.e.f. 1st August. ■

Rakesh Misri takes over as Director Marketing of HPCL



Rakesh Misri

Rakesh Misri took over as Director-Marketing of HPCL on October 17. Prior to his appointment as Director-Marketing, Misri was Executive Director-Marketing Coordination in HPCL. A Gold medalist in civil engineering from REC Srinagar (now NIT Srinagar), Misri has a rich and varied professional exposure of over 36 years in HPCL. He has held various senior level

positions in the organisation heading the north zone retail, executive director-direct sales, executive director-human resources, executive director-corporate strategy and business development, and executive director-LPG.

He has various academic distinctions to his credit and is a key technical speaker in In-house capability building seminars and workshops. ■

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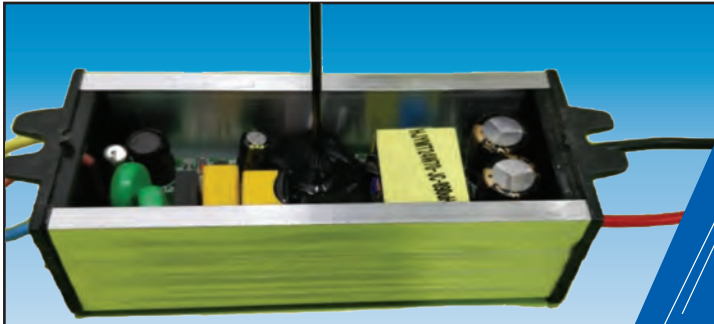
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Global architectural LED products market to grow by 14% CAGR: STUDY

The study by PMR reveals that manufacturers of architectural LED products prioritising enhanced brightness, in addition of energy efficiency.

Worldwide sales of architectural LED products reached around US\$ 7,136 million in 2018 according to a recent study published by Persistence Market Research (PMR). As per the report on Architectural LED Products Market by PMR, the global architectural LED products market is anticipated to grow by CAGR of about 14 per cent year-over-year in 2019. Government regulations related to the construction of artistic buildings across various regions have been fuelling the demand for efficient lighting systems from construction and building management companies. Governments in many countries have banned the usage of incandescent lighting products for improving energy efficiency and reducing CO2 emissions. Due to this, construction companies are encouraged to deploy LED lighting systems, following government regulations on low carbon emission and energy saving.

As per the report, factors such as increased lifespan of LED products, government regulations, decreasing cost of LED products, uniformity in the standards will continue to drive the growth of the architectural LED products market throughout the forecast period. Currently, businesses around the world are shifting from incandescent lights and opting for LED lights instead, as they are durable, efficient, and help reduce energy cost. Moreover, architectural LED products use about 50 per cent less electricity than traditional incandescent lights, which makes them more power efficient.

As per the research study, the architectural LED products market is poised to create an incremental opportunity of around US\$ 21,708 million throughout the forecast period. Conventional architectural LED products continue to account for major share of manufacturers' bottom lines, in the view of increasing demand for strip LED products for cove lighting.

Demand Bolstered by Growing Smart Cities Projects

Government organisations are launching several smart city initiatives, which in turn is likely to increase the demand for architectural LED products, as they help reduce energy cost and cast unadulterated light, similar to daylight. Architectural LED products are available in a different colours and temperatures that are suitable for a range of applications. Moreover, increase in demand for energy efficient lighting solution and rising investments in smart city infrastructure such as roadways, parks, and commercial buildings will continue to favour the growth of the architectural LED products market.

Tier-1 Players to Account for 20 per cent Revenue Share

The study opines that the global architectural LED products market is considered fragmented, owing to the presence of a large number of local players. The research study has segregated the market structure into three tiers: Tier 1, Tier 2, and Tier 3 for deep-down analysis. Tier-1 architectural LED product providers account for ~18 per cent-20 per cent of the overall market. Tier-1 vendors, are the most experienced and largest in the industry and have a vast regional coverage across the globe. These vendors are collaborating and partnering with new players in the market to expand their distribution channel. Tier-3 architectural LED product providers are fairly new in the market, and includes mostly local and regional players. As tier-3 players have a limited presence in the market, they constantly keep themselves updated with the latest technology and are growing at a rapid pace.

For instance, in July 2019, the OSRAM Litch AG introduced high-power LEDs for general lighting with the Osconiq P 3030 that provides long life and excellent brightness and efficiency values in flashlights and work lamps.

Similarly, in October 2018, Cree Inc., introduced its industrial lighting portfolio with the new XB Series Linear High-Bay luminaires. The series includes enhanced efficacy, extended life, which makes it an ideal solution for high ambient temperature, high ceiling, and high-profile spaces. ■

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LED: WHAT'S THE FUTURE

The Indian lighting industry has undergone a significant transformation owing to the arrival of LED lighting. Here, we throw light on the opportunities for India LED business beyond 2020.

In 1854, a German watchmaker Heinrich Göbel, invented the first incandescent light bulb. Since then, the lighting revolution went very quickly. In barely 150 years, from incandescent light bulbs – to compact fluorescent lamps (CFL) in 1980s – to LED lighting in 1990s – the lighting industry has witnessed remarkable transformation.

According to a new report by Grand View Research, the global LED lighting market size is expected to reach US\$ 105.66 billion by 2025. It is expected to register a CAGR of 11.8 per cent over the forecast period. The revision of energy policies and focus towards developing energy-saving products accompanied by reducing LED product prices is expected to keep the market buoyant. Moreover, the report said, lucrative benefits such as longer lifespan, low heat emission, and most

importantly lesser energy consumption as compared to traditional lights such as CFL lamps is anticipated to boost the product demand.

LEDs have also transformed lighting from analog to digital, enabling users to remotely control and monitor them. The digital capabilities of LEDs enable tremendous customisation in terms of light output and application and has also brought illumination and IoT (Internet of Things) together, allowing lighting systems to participate in the IoT. This has led to the emergence of connected lighting, marking a significant shift and transforming lighting from a commodity product to a fully integrated lighting system that can seamlessly connect with a wireless network or Ethernet, allowing users to remotely control and monitor their lighting systems. This has multiple

There will be a demand for more energy efficient and intelligent lighting in the future, as the world focuses on enhancing sustainability and conserving energy.

SUMIT PADMAKAR JOSHI

Vice Chairman and Managing Director, Signify Innovations India Ltd



applications in smart cities, buildings and homes, making lighting intelligent and personalised.

Here, we throw light on the opportunities for India LED business beyond 2020. As per a report published by TechSci Research, LED lighting market in India stood at US\$ 918.70 million in 2016, and is projected to grow at a CAGR of 24.66 per cent, in value terms, during 2016-2022, to reach US\$ 3,758.74 million by 2022, on account of increasing government initiatives to boost LED adoption and growing awareness regarding lower power consumption of LED lighting products.

Commenting on the recent status of LED lighting industry in India, Sumit Padmakar Joshi, Vice Chairman and Managing Director, Signify Innovations India Ltd, said, "Over the last few years, the Indian lighting industry has undergone a significant transformation owing to the arrival of LED lighting. Lighting has become more energy efficient and intelligent, opening up a whole new range of applications that have never been seen before, such as Li-Fi (light fidelity). Aided by government programs such as Unnat Jyoti by Affordable LEDs for All (UJALA) and Street Lighting National Programme (SLNP), there has been a rapid adoption of LED lighting across homes, private offices, public buildings and monuments."

Under UJALA, LED bulbs are being made available at cheaper rates than the market price. More than 350 million LED bulbs have been sold so far under the programme. As per data available on Electric Lamp and Component Manufacturer Association of India (ELCOMA) website, about 1.4 billion bulbs and tubelights were manufactured in India in 2018. About 46 per cent of these were LED lighting and 43 per cent were incandescent bulbs with rest being CFLs and fluorescent tube-lights, the association estimates.

Bhavin Soonderji, Tridonic India (Atco Controls India Pvt Ltd), Managing Director, observes, "The penetration is getting deeper and traditional light sources are being replaced rapidly. The huge volume has also led to cost pressures which were not seen in the traditional light source business."

Mr Joshi adds, "The lighting industry in India will continue to grow over the next decade, owing to increasing urbanisation, enhanced consumer awareness about LEDs and the growth of smart cities. We anticipate the demand for LED lighting to grow exponentially in the future."

Recent advancements

Signify is one of the global leaders in lighting products, systems and services. The company serves both professional and consumer markets, transforming urban spaces, communities, workplaces, stadiums, buildings, shopping malls and homes.

Talking about some of Signify's recent advancements in LED segment, Mr Joshi said, "We have always focused on innovation, creating new products and services for the benefit of consumers. We spot a problem which nobody focuses on and grow in that segment by coming up with groundbreaking and futuristic solutions. Through our innovations, we unlock the extraordinary potential of light for brighter lives and a better world."

Mr Soonderji's company represents Tridonic in India. He said, "The biggest advancements still come in terms of connectivity of devices for smart offices, safe cities, and smart cities – connected lighting systems."

Signify has recently announced the launch of its Interact IoT platform for connected lighting, which will enable professional customers to unlock the full potential of their connected lighting assets. The platform delivers new insights to help customers drive operational efficiencies and take more effective decisions. It also supports the company's strategy to deliver new data-enabled services as value expands from lighting products and systems to services.

Signify has already installed 50 million connected light points worldwide and plan for every new LED product we produce to be connectable by 2020, informs Mr Joshi. This growing number of connected light points, sensors and devices, as well as systems, can collect large volumes of data that Interact was designed to handle. The highly secure, scalable cloud-based Interact platform uses sophisticated and modern data management and data processing capabilities, including machine learning, to bring sense to all manner of data – creating data-enabled services for customers that will deliver benefits beyond illumination.

The company has also recently launched Li-Fi, which is a technology in which high-quality LED lighting provides a



The biggest advancements still come in terms of connectivity of devices for smart offices, safe cities, and smart cities – connected lighting systems.

BHAVIN SOONDERJI,

Tridonic India (Atco Controls India Pvt Ltd), Managing Director

stable and fast broadband Internet connection through light waves. As the lighting company for the IoT, Signify claims to be the first global lighting company to offer Li-Fi-enabled luminaires from their existing office lighting portfolio. While radio frequencies are becoming congested, with more devices trying to connect and overloading networks, the visible light spectrum is an untapped resource with a large bandwidth suitable for stable simultaneous connection of a vast array of IoT devices. "Being a lighting company, we ensure that our customers benefit from the finest quality energy efficient lighting along with state-of-the-art connectivity," says Mr Joshi.

This year Signify intends to focus on further expanding the reach of their new LED innovations – Philips T Beamer, Philips EYE PRO and Philips Smart WiFi LED bulb. They will also focus on expanding their presence in the rural channel with customised offerings, informs Mr Joshi.

He adds, "We are also investing significantly to grow our smart home lighting business in both offline and online channels, through our exclusive Philips Smart Light Hubs and with our presence on all major e-commerce portals. We also tied up with smart home assistants such as Google Home and Amazon Alexa, to offer connected lighting to customers via voice command. By the end of the year, we expect to double our retail presence for smart lighting in the country with new Philips Smart Light Hubs opening across various cities."

India LED business beyond 2020

Growth in the lighting industry will come from new home construction, evolution of smart cities and street lighting, avers Mr Joshi while discussing on the opportunities for India LED business beyond 2020. He said, "There will be a demand for more energy efficient and intelligent lighting in the future, as the world focuses on enhancing sustainability and conserving energy."

Urban populations are growing rapidly, and by 2030 it is predicted that close to 60 per cent of the world population will be living in cities. In the home of 2030, lighting will be able to synchronise with everything from doorbell to television and music and will be fully adjustable to individual preferences. It will pre-empt your needs and complement your well-being, energise you, relax you and keep you safe.

Philips Hue personal lighting range enables consumers to personalise their lighting experience using the Hue app on their smartphone. It can turn everyday lighting into an extraordinary experience. The system syncs seamlessly with music, movies and games, and transforms your room into an entertainment arena, bringing spatial awareness and immersiveness to a whole new level.

By 2030, it is expected that there will be close to 70 billion light points in the world. Public lighting is installed everywhere: where people live, work, play and travel. Its primary function is to provide energy efficient, quality light to enhance public safety and enhance the urban landscape. However, according to Mr Joshi, in the future a city's lighting infrastructure will also offer enormous potential to be part of a city-wide network capable of acquiring data and delivering information and services to and from millions of devices, from garbage bins to autonomous vehicles. In this way it could help enable smart city services to improve the lives of its citizens and city managers alike.

Connected LED streetlights provide highly energy efficient, quality light, but they can also act as sensor nodes on an information highway. In 2030, connected streetlights could stream data between millions of devices. Connected lighting infrastructure will collect and distribute data and improves city services such as light, traffic, air quality, public safety, parking and other location-based services, leveraging state-of-the-art communication technologies. Autonomous vehicles will navigate roads safely, using and communicating with sensors in streetlights that scan the road and pavements, and provide a frame of reference by transmitting situational information to augment the vehicles' on-board sensors.

Explaining the opportunities, Mr Soonderji said, "The opportunities are very robust owing to a large installed base of traditional lighting. Also, as we approach the 5-year mark, there will be refurbishment projects where the customer will benefit hugely from improved efficiencies." He adds, "The future of lighting is set to become the backbone on which other services work and potentially customers will pay for the service and get light rather than buying a light fixture as is the traditional way today, and Tridonic is a pioneer in this aspect." ■

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Contact us:

Mr. Brijesh Nair | T: +91 22 4255 4707 | E: brijesh.nair@mm-india.in

Ms. Ayesha Salve | T: +91 22 4255 4702 | E: ayesha.salve@mm-india.in

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LED Expo breaks records yet again!

LED Expo, to be held between 14 and 16 November in Greater Noida, to feature 350 exhibitors with eight international contingents.

With the government's announcement of installing 2.1 lakh LED street lights in Delhi, it is a clear indication that the state capital has joined India's LED revolution in full force. The growing need for LED technologies has also resulted in a sold-out edition for LED Expo New Delhi 2019 once again with 350 exhibitors from nine contingents including India.

The show, now in its 21st edition, features exclusive pavilions from China, Hong Kong and

Taiwan along with other countries like Finland, Italy, Japan, Korea and the UAE, to display a massive 25 per cent surge in space and 24 per cent increase in international participating companies. Companies like Tata Communications, Osram Opto Semiconductor, MLS India, Millennium Semiconductor, Juki India, Cresnet Opto Ahmedabad, Glow Green, Componix India, Edison Opto, S R Electro, and Murli lights will be some of the major players at the show.



EcoEarth Lights

Smart living with lights from the Future zone

Cognizant consumers are going beyond the term "eco-friendly". A vast majority are now gaining awareness of a better lifestyle that smart technologies can provide along with being eco-friendly and energy saving.

To cater to these needs of the Indian market, the up-coming edition of LED Expo New Delhi 2019 will host an exclusive 'Future Zone' which will display tech-novelties, unique and innovative solutions from Ecoearth Electric Pvt Ltd, ZI Lite Industries (Red Card), Litomatic, JAR Lights, Tuya Smart (India) Pvt Ltd and Eslux catering to the users eyeing smart lighting technologies.

Some of the latest innovations to be displayed include:

- Smart lighting solutions that optimises street lighting, conserves energy and enables two-way communication between street lights and the command centre, giving organisations unified control of widely distributed street lights by Tata Communications.



ESYLUX_SmartDriver

- First time in India, launch of auto clean solar street light and smart solar charge controllers with dual output and IR, RD remote operation by Jar Lights India.
- Launch of IoT smart lighting solutions called "Ecoearth Neo" and smart Wi-Fi bulbs that can be operated by google home and Amazon Echo by EcoEarth Electric Ltd.
- Launch of BLDC ceiling fan solution with LED night lamp that can save more than 65 per cent of energy by Semiconic Devices.
- Launch of advanced technology AC-DC such as Inverter bulb, Flicker free and motion sensor-based products by Chetna Electronics Pvt Ltd.
- Launch of SmartDriver as an intelligent control unit and flicker-free lights for healthy and fatigue-free working with 60 per cent time



Optiks Mechatronics



SEMICONIC DEVICES BLDC fan solution

savings on installation and commissioning and up to 70 per cent energy saving potential by ESYLUX Asia Ltd.

- Launch of 125 Lm/Watt 120V/277V IP66 fixture with built in junction box that can replace existing well glass fixture and is suitable for cooking area, food industry, cold storage, tunnel, mining industry, agriculture industry, construction industry and other hazardous areas by Overdrive Electronics Pvt Ltd.

The three-day show will also host the industry's renowned and trusted knowledge conference, LED summit focussing this time on 'Integrated Solar LEDs'. A premier forum co-organised with SESI (Solar Energy Society of India) for the LED industry, the LED Summit, has successfully attracted top level speakers and highly qualified professionals across the industry in its previous editions. Completing 11 editions, the knowledge forum has been highlighting products that promote domestic manufacturing, implementation of LED lighting standards and Smart Solutions for Future Lighting. ■



JAR Autoclean Solar Street Light



Tata Communications



Tata Communications

FULHAM:

MAKING INDIA A GLOBAL MANUFACTURING HUB



Going forward we are poised to see a significant growth in our sales to international territories such as the USA and Europe out of our manufacturing facility in Pune.

Gautam Malkani, Managing Director, Fulham (India) Pvt. Ltd.

Over the years, Fulham has emerged as a global supplier of cutting-edge technologies including LED components and various lighting solutions. Now, with the advent of digital technology, Fulham is adding intelligence to LED lighting. In an interview with Lighting India, Fulham India's Managing Director Gautam Malkani gives an overview of the company's recent advancements in the lighting business.

Q What's your take on the recent status of LED lighting industry in India?

A The Indian LED lighting market which stood at approximately Rs. 6,000 crore (US\$ 850 million) in 2016 is poised to cross Rs. 25,000 crore (US\$ 3.6 billion) mark by 2022. These are definitely very exciting times for the industry as a whole. LEDs have virtually replaced all kinds of conventional lighting products in the past few years. The introduction of the CRS (Compulsory Registration Scheme) by MeitY in 2015 has ensured that the industry is moving towards establishing regulated design and quality practices in the market. Increased sophistication of manufacturing processes in the industry is also leading to improved quality standards of Indian manufactured lighting products. Overall the industry is maturing to eventually come to terms with globally accepted standards in product quality.

Q What are some of your recent advancements in this segment?

A Fulham as a company is focused on developing "Clever" products which can provide users with several value-added functions. Going forward there will be an increasing need for

connected and demand driven lighting which at the same time also provides users with historical data regarding use of the products. For example, all our Programmable DALI and Analog drivers record thermal data of the driver during the lifetime use of the product thus providing engineers and designers critical data which can be used for failure analysis, future luminaire design for thermal management etc.

Fulham in the recent past has also developed a range of versatile, reliable and robust outdoor drivers to meet the challenging power conditions in India specially for streetlight applications.

Q How do you gauge the opportunities for India LED business beyond 2020?

A The Internet of Things (IoT) has opened new opportunities for device management. Smart cities in particular will benefit, but creating smarter cities means we need smarter integration strategies. Community and citizen services are going to need a stable, scalable IoT infrastructure that extends beyond historical control systems. Integrating wireless IoT controls in LED drivers for outdoor lighting will likely be the first step. Companies in the know-how of building wired and wireless communicable luminaires and "System Integrators" will stand to benefit from the opportunities that will be available with the increased penetration of IoT in our daily lives.

Q Fulham India aims to be the global manufacturing hub for exports. Where does it stand today?

A Over the years Fulham India has been the pioneer in exporting Indian-made electronic ballasts, LED drivers and light engines across the globe. We currently service the U.S., Europe and Middle East market from our manufacturing facility in Pune. It will be interesting to note that we have also done exports of Light Engines into China in the recent past which speaks about our capabilities and India's global cost competitiveness. Going forward we are poised to see a significant growth in our sales to international territories such as the USA and Europe out of our manufacturing facility in Pune.

Q Smart lighting business is gaining traction in India. How do you look at the scope for your business in this segment?

A Lighting provides the perfect skeleton for an IoT infrastructure, especially streetlighting which can be extended to monitor and manage other devices. Streetlights being spaced at regular intervals throughout the city provide the much-needed connectivity to wirelessly monitor traffic patterns, or to measure air quality or rainfall. Adding IoT capability to streetlight LED drivers also makes it easier to monitor and troubleshoot the lights themselves. At Fulham we are working with various integration and technology partners to provide smart radio-enabled LED drivers using GSM, LORA, NBIoT and other such communication platforms for use in streetlights and other outdoor applications. With the Govt pushing to implement its

"100 Smart City Programme" across the country, we see a substantial scope for an increased penetration in the segment of smart outdoor lighting in the near future.

Q Fulham has recently launched advanced LED Retrofit Kits and Bluetooth lighting controllers. Are these products available in India?

A Fulham's new linear high output LED retrofit kits are available in India and are being sold in specialty lighting applications such as signages, billboards and other similar applications. The 22-inch and 44-inch boards are mounted in aluminium extrusions to eliminate the need for additional heatsinking, with pre-installed magnets to simplify alignment and installation. The Bluetooth enabled devices are being introduced in India and will be available starting January 2020. They can be controlled using simple web and iOS apps. Users can easily customise lighting control parameters in accordance with site-specific needs and building energy codes.

Q Let us know more about your participation in LED Expo Delhi 2019.

A Fulham has been participating at the LED Expo India since the past 5 years and we consider this show to be one of key events held in India to showcase the capabilities of the Indian lighting industry. The show this year will be memorable for all of us at Fulham as we will be having our founder, Mr Brian Wald back on center stage with us once again. This year we are also celebrating our 25 Years Anniversary of servicing the needs of the lighting industry. At Fulham we consider the show to be an integral part of our annual marketing agenda as we get to exhibit our new technologies, meet with our trusted customers and interact with captains of the industry. Over the years we have seen this show successfully grow to become the pivotal show for lighting components in India.

Q What will be the key attractions at your stall?

A During this year's show we will be focusing on displaying our capabilities in the area of "Emergency Lighting Systems". On display will be our revolutionary HotSpot Plus LED Driver and Emergency System which combines the functions of a dimmable, programmable LED driver, emergency LED driver, and replaceable backup battery in a single compact and easy to use unit.

In addition, we will also be displaying the recently launched WorkHorse LED Connected Driver which is a programmable constant current dimming driver with the unique ability to add Bluetooth mesh connectivity by attaching a plug-and-play Bluetooth antenna. Fulham's eliteBlue commissioning software provides an intuitive set of tools for commissioning and monitoring qualified Bluetooth mesh lighting devices. Compatible with third-party sensors, wall switches, and other devices, the Connected Driver serves as the core component for powerful, easy-to-expand connected systems. ■

REJUVENATION OF BUILDINGS WITH FACADE LIGHTING

This article tries to explore the techniques and benefits behind efficient and effective facade lighting. The emphasis is on a lighting practise referred to as exterior wall wash lighting.

World's Largest LED Display Lighting,
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It has long been held that the night architecture is noticeable through great night lighting. So, although an architectural landscape may be majestic and striking in the day, even greater focus can be achieved at night. Most impressive monuments, galleries and historic buildings in any city, have always stood as visible icons to our designers and our history.

The same concepts are now being represent through architectural design and lighting, in corporate offices, commercial buildings, industrial campuses and even in residential complexes. Lighting design is being mixed with direct exterior lighting to signify and point up key features, and deliver much more than just only illumination. The building

facade itself can become the highlight and visual central core, representing the attributes, quality and styling that the architect and building owner together, hold to be true.

This article tries to explore the techniques and benefits behind efficient and effective facade lighting. The emphasis is on a lighting practise referred to as exterior wall wash lighting. This concept is now being globally adopted, in what could be described as a renewal and blending of old and new. Architectural design, functionality, order and styling meet aesthetics, economic, sustainable and dynamic lighting that is expressing sympathy to its surrounds although delivering high visual impact. Design matched with lighting that has the

potential to witness energy, passion and components that convey the values, beliefs and culture of any business.

Given below are some techniques and benefits behind efficient and effective facade lighting.

Enhancement, amplification and marketing of Lighting

There is a new concept in architectural design that is in tune with the building owner. Lighting designers and architects are working unlike before, with more than a brief about lighting. They are actually working with a strong belief. A belief to develop more than just a beautiful and functional building. With concepts like exterior wall wash lighting, designers and architects are bringing life in the night through lights, into structures.

This is about creating a beautiful blend of building design and exterior lighting. A business or commercial building that produces quality products services and solutions, reproduce this through attractive design and styling. The old conventional practise of creating visible building at night through lighting is proving uneconomical, waste and lacking imagination and effectiveness.

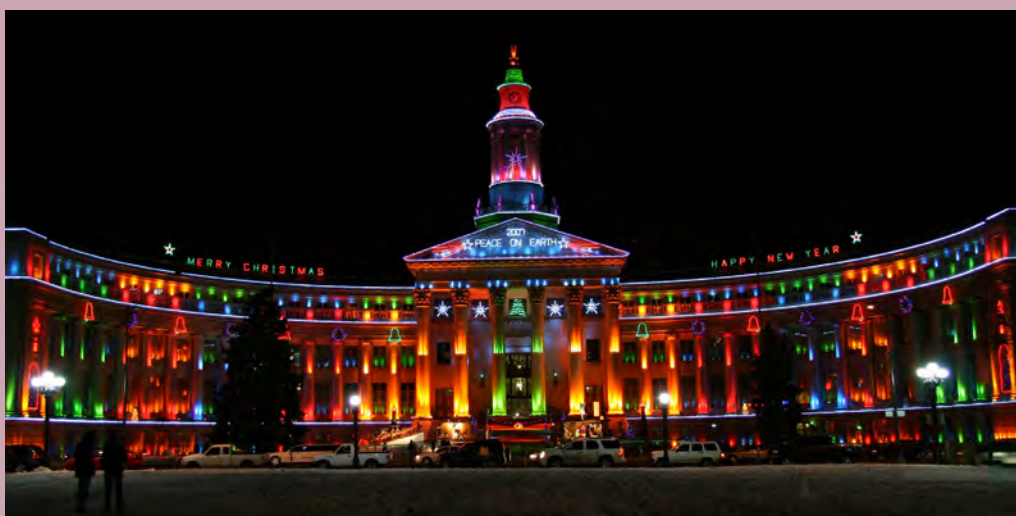
Bringing the Blend to Life

Global practises are showing a huge increase in exterior lighting and in particular illuminated facades. There are particular challenges to be addressed in effectively blending design with lighting, and achieving the desired outcomes for the business or the building owner.

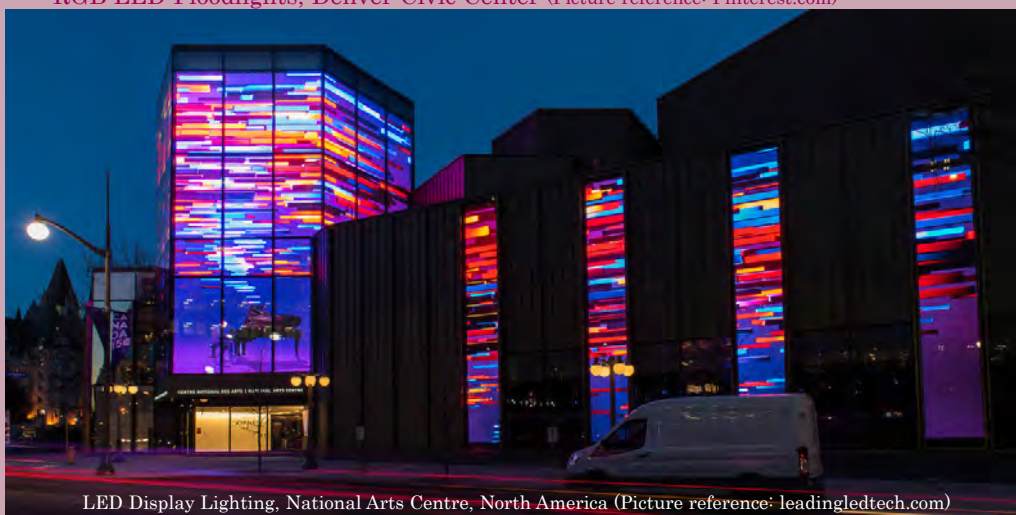
A building that uses exterior light inefficiently, is seen as



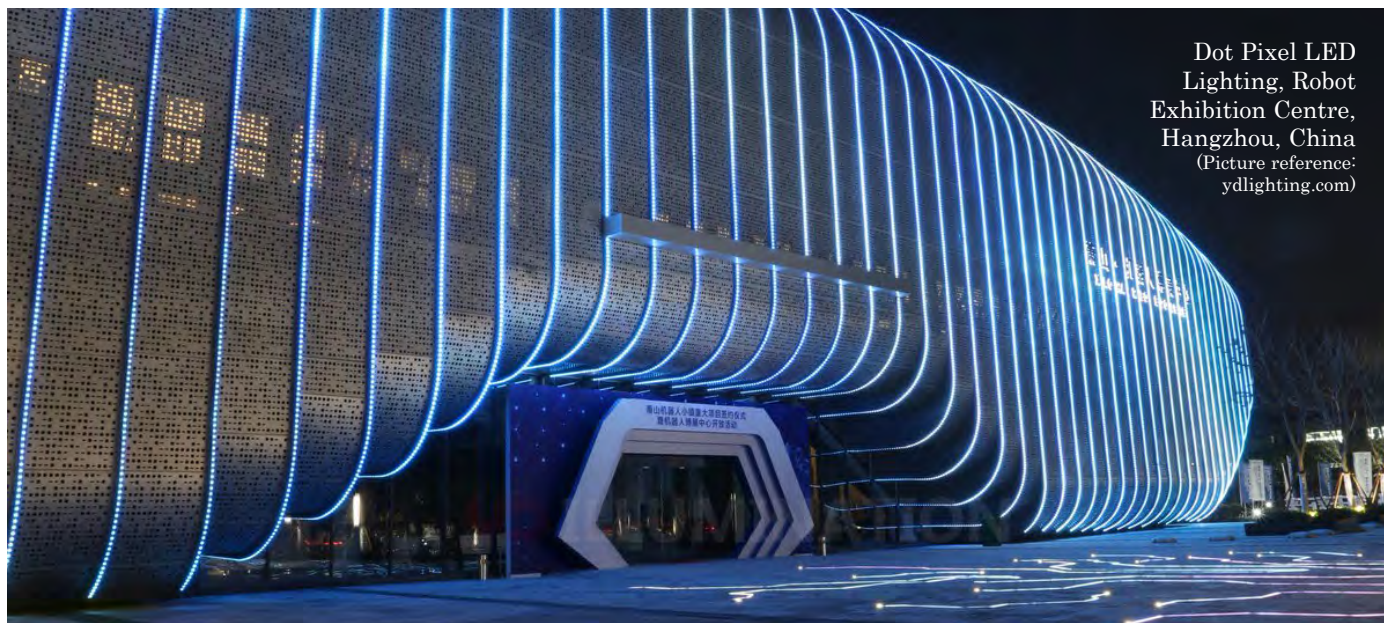
Wall Wash Lighting, Galleria Centercity, South Korea (Picture reference: UN Studio)



RGB LED Floodlights, Denver Civic Center (Picture reference: Pinterest.com)



LED Display Lighting, National Arts Centre, North America (Picture reference: leadingledtech.com)



Dot Pixel LED
Lighting, Robot
Exhibition Centre,
Hangzhou, China
(Picture reference:
ydlighting.com)

waste and out of context. Contrarily, strong and bold imagery created through design and lighting is seen as a translation of creativity, uniqueness and innovation. This is the context that is driving this beautiful blend of design and lighting. The best examples of this are addressing and harmonising the blended inputs of visual, emotional, functional and sustainable design.

When creativity and imagination matter

Wall wash lighting is enabling the visual depiction of elements and attributes that serve a business, marketing and positioning. In buildings lighting can convey prestige, impact and it can be impressive and visually striking. Buildings that seek market presence and in making bold statements are doing so with their design and attention on them through exterior lighting.

Merging style and form, the attention of features, design elements, choice of building materials, and representation of the company logo are few key elements that can be strengthen through exterior lighting.

This approach towards exterior lighting is striking a sense with global communities and is reflecting the values, beliefs and spirit of business or building in an engaging fashion. Wall wash lighting is being used widely to signal, attract and engage the market, to outstanding effect. These creative attributes in exterior lighting design are increasingly transforming a building from presentable to exceptional.

The lively breathing structures

Graceful aesthetics are created by designers that incorporate lighting with design that is friendly to the local environment. Lighting away from natural ecosystems and appropriate lighting that serves to illuminate, highlight and direct, are both examples of this. Lighting that is sensitive to nocturnal (active at night) animals, especially in low urbanised environments adds to friendly environment on the building in a natural setting.

Architectural facade lighting may incorporate a variety of effective techniques for wall wash lighting. Architectural facade lighting is not handled by economic pressures. Regulation and

integration of the exterior lights with natural light further helps to minimise light usage and cost. Wall wash lighting has consistently proven itself as a lower cost technique with high visual impact and attractiveness. The lifecycle investment associated with wall wash lighting profiles it as proven, robust and predictively low-cost lighting alternative, supporting its popularity in recent times.

Applications

Following are the applications for exterior facade and elements lighting:

- Contemporary architecture exterior lighting
- Historical building façade lighting
- Event and stage lighting
- Bridge flood lighting
- Exterior landscape lighting.

Bringing it all together

The range and choice of products for wall wash lighting in India, has never been substantial. Specialist products in the market are designed for exterior facades, features and creating visual impact. A variety of applications based on type, colour and intensity of light and washing required, are available in the Indian market. Although specialist lighting designers are provided by the companies dealing with lighting manufacturing and retailing. These items include units which are building mounted, in ground up lights, flood lights, stage and event lights, RGB/ RGBW/ RGBWA LED lighting for colour selection, available in various size configurations and mounts to meet definitive specification of the building or application. ■



Author
Ashish Batra
Consultant (Architect/ Urban Planner)
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GOOD LIGHTING SHOULD IMPROVE USER EXPERIENCE



The more you work with lighting, there is more to learn every day. People think it's a small niche but in truth the areas that lighting touches and influences directly and indirectly in a project is immense.

-Ranjith K Kartha, Director & Principal Lighting Consultant, Veda Lighting Design & Systems

Bengaluru-based Veda Lighting Design & Systems Pvt Ltd is an independent lighting design consultancy that brings in global best practices to India. In an interview with Lighting India, the company's Director and Principal Lighting Consultant Ranjith K Kartha narrates his journey in the field of lighting. Excerpts:

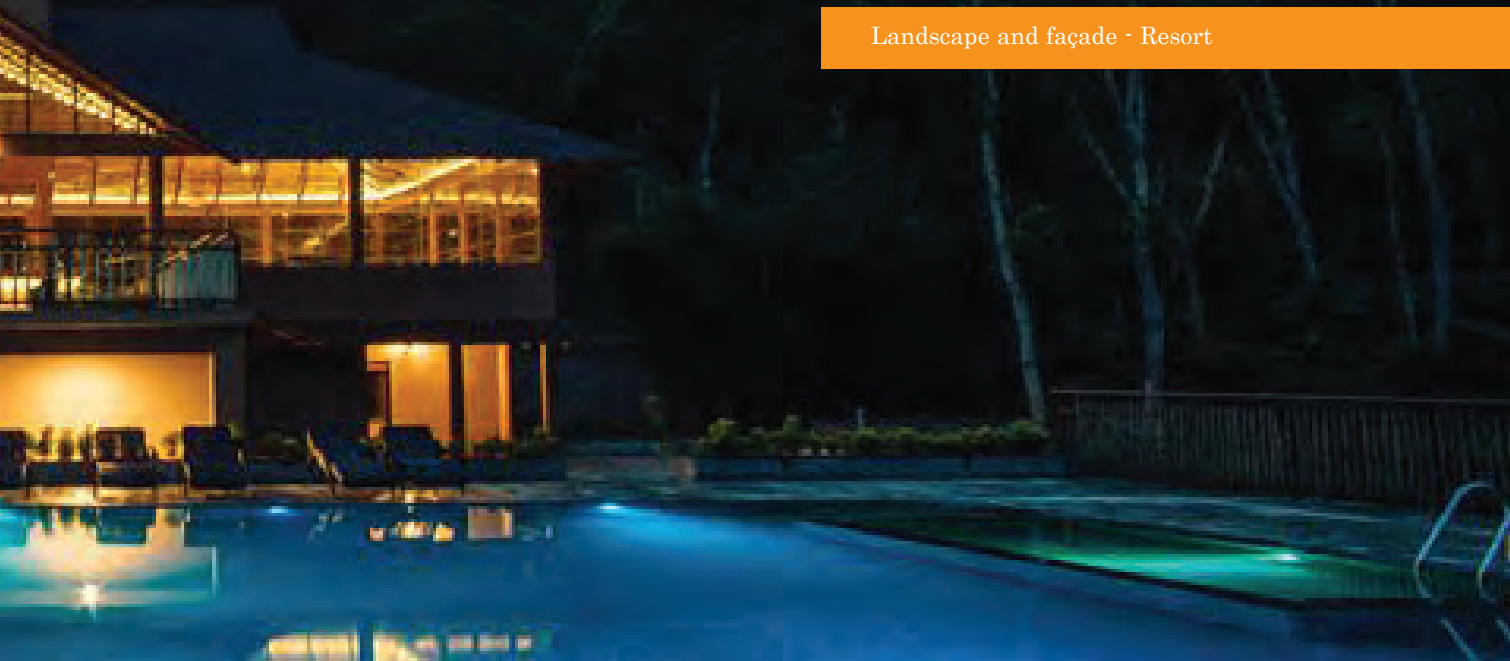
Q You have studied lighting from the prestigious Lighting Research Center (LRC), New York. What's your take on the status of lighting design practices in India?

A I would say the awareness of good lighting has definitely grown in India among the user or builder community and the architect community. But for the number of architecture

or interior design practitioners across India, we are just a handful.

One of the primary factors that determine good lighting is the allocation of the 'right' budget for lighting when it comes to projects. Everything in India is budget driven. If I consider interior lighting – the proportions have to be re-looked at. There is a lot spent on finishing, granites and other decorations while the essential tool (that is light) that helps highlight all these is not given its due. Lighting should move from an expense to an investment mindset for the industry to really kick off - because we are not thinking of lighting as a means of illumination alone, we are concerned of user comfort, brand communication and

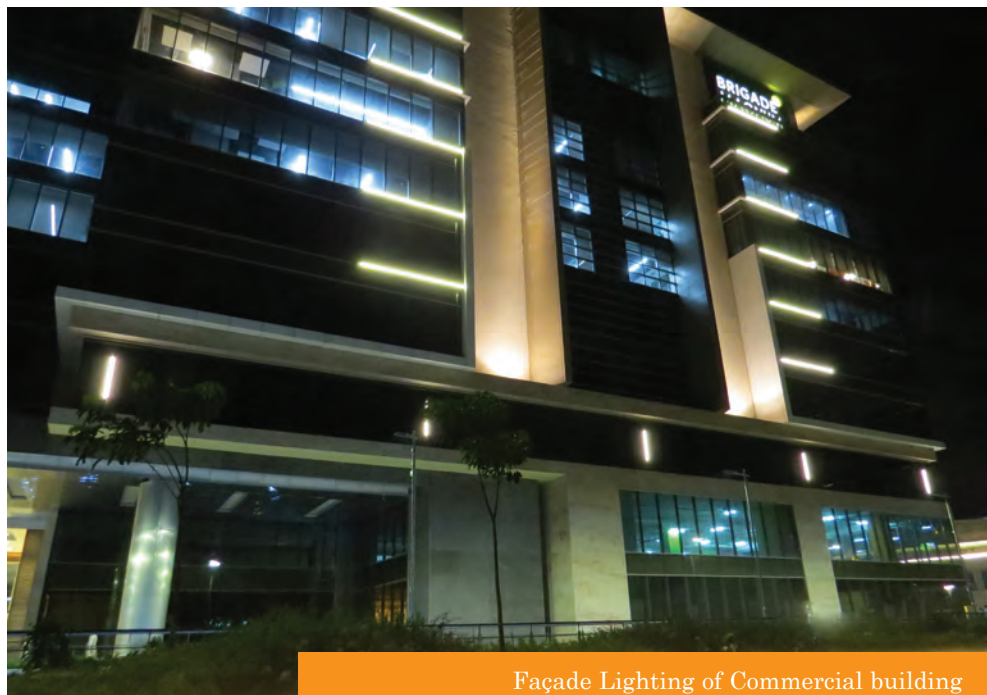
Landscape and façade - Resort



a lot of other emotional and intangible elements that you cannot put on an excel sheet. It is also important that those who wish to get into the lighting design profession undergo a proper course of study. There are innumerable lighting suppliers who become lighting designers overnight just to push sales. Of course, one picks up a lot of lighting knowledge while selling products over a long time, but what is most important here is whether they are providing the right advice and whether they are looking at things holistically. What happens is that when people don't advise right, it drags the whole industry down. For example, any civil contractor can build a house without an architect, but having an architect onboard brings in aesthetics, user dynamics, better use of colour, texture and form, elements of daylight etc. This is the real knowledge through training and learning!

Q What brought you into this profession?

A I have been in lighting since

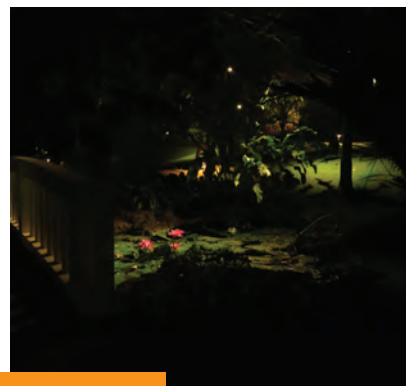
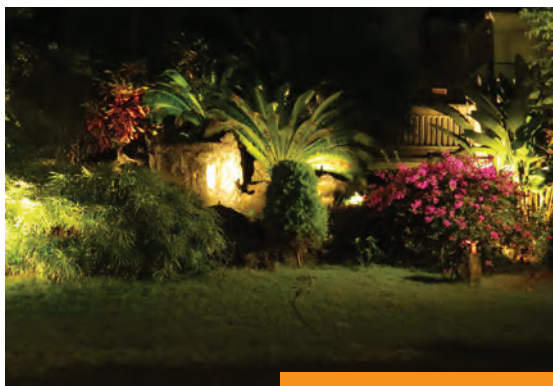


Façade Lighting of Commercial building

2002. I started with manufacturing and custom design after my bachelors in mechanical engineering. So naturally, I built my skills around that in managing people, marketing, sales etc., but the true pivot to learn further and deepen my knowledge happened during my stint at Dubai in the year 2005 when I was exposed to the magnificent projects there. Later I went to LRC on a scholarship for the MS program and worked a short while in New York before getting back to establish the practice. So, it's been a journey of discovery...one leading to the other.

Q What is it that fascinates you about light?

A The more you work with lighting, there is more to learn every day. People think it's a small niche but in truth the areas that lighting touches and influences directly and indirectly in a project is immense. The creative and artistic input is at least 80 per cent.

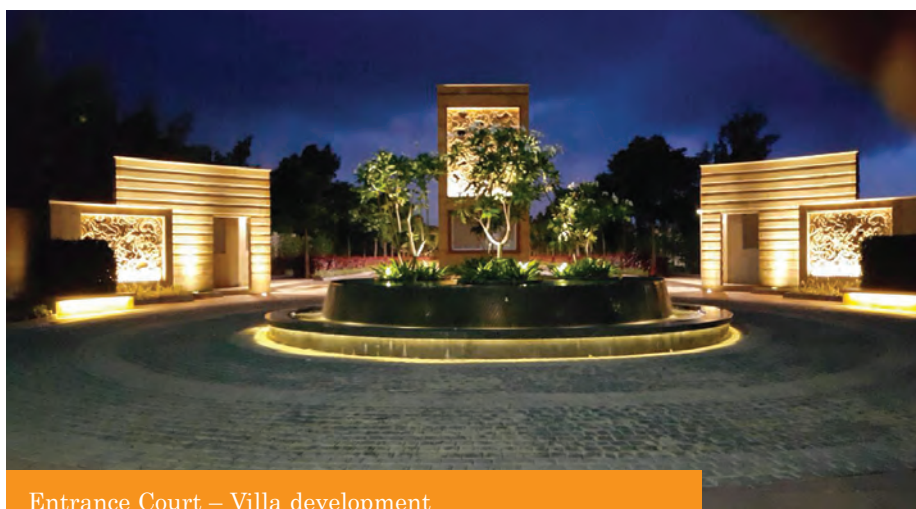


Landscape lighting - Residence

So, you never get bored. And it's not linear thinking. I am always on a learning and absorbing mode. Keeps me on my toes. Keeps me feeling young.

Q What's your lighting designing philosophy?

A Good lighting in addition to illumination should heighten the user experience. We try to look at all projects with a fresh pair of eyes and try not to bring in biases from previous projects. At a home, how should the family and guest experience be? At a lobby, how should the visitor experience be?



Entrance Court – Villa development

Don't do anything for the sake of external validation. Write your own story and believe in your own story though the other's story might seem more fascinating.



Facade Lighting – Shopping Mall



Indoor Lighting – Shopping Mall



Mini golf putting court - Residential Development

At a hospital, how should a patient experience be? On a lawn, how should the evening experience be? These thoughts drive our design process and visual language.

Q What are the challenges you faced at the beginning of your journey in the field of lighting?

A We started in early 2011. As any design practice, it takes a lot of time meeting people, getting a project, executing it and seeing the end result, then taking that as a reference to your next client and then the next! Unlike an architect or a graphic designer who is starting up, my additional challenge was and to a certain extent even today is in convincing why they need a lighting designer on board, and most importantly why he should also be paid well.

Q What does it take to successfully lighting a space?

A I think the most important elements are to drill deep down to understanding the client, his needs, his aspirations, then of course the space – what is it doing, how is the space flowing, who is using, when, how, how will it change over

time etc. And, mastery on the tools available in terms of luminaires, controls, software, lighting methods, installation etc.

Q What was your most challenging experience in a project you've worked on, and why?

A I am unable to recall 'one' specific instance. Every project comes with multiple challenges. In one, it could be a heightened level of frustration from not able to get your design across to the end client, in another one the client just wouldn't budge an inch on the budgets to get a better lighting., in another it is confusions that arise when coordination falls apart at a site – drawings are not right, things at site do not reflect on paper etc. Sometimes it is the collaboration with the primary designer. Sometimes we have a polished granite that we would like to change to matt, or similarly take out or add things against what an architect or interior designer has previously imagined. These are all part of any project. End of the day everybody has a learning experience.

Q What advice would you suggest to budding lighting designers?

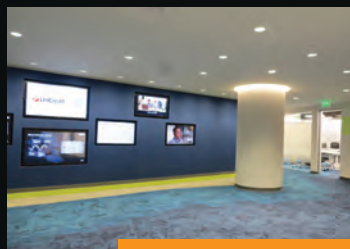
A My advice to anyone who takes up any profession is to really immerse themselves in it. Don't do anything for the sake of external validation. Write your own story and believe in your own story though the other's story might seem more fascinating. As Warren Buffett said long ago, the biggest investment that you would ever make in life is on yourself. So be mindful of the time spent, the experiences gained and challenges you put yourself into. ■



Interior Lighting - Spa



Interior Lighting - Clubhouse



Interior Lighting – Commercial office



Interior lighting – Residence



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Facade



Lobby



VIP-Lounge

MGM Healthcare

Super-speciality hospital requiring specialised lighting

India's glorious past in medical education and sciences is world-renowned with famous experts such as Jivaka Kumarabhaṅga and Charaka showing the world how to treat diseases and illnesses. At a time when surgeries worldwide were done primitively, well-trained surgeons in India such as Sushruta performed the most advanced and complex surgeries, including cataract, plastic and reconstructive surgeries. Sushruta was also a great teacher who enabled students gain practical hands-on experience in surgical skills by making incisions on the skin of fruits.

Inspired by such a glorious past, the Mahatma Gandhi Medical (MGM) College and Research Institute has built itself a reputation for medical education in India. The next stage in its evolution of becoming an integrated healthcare player has been the launch of India's first USGBC LEED Platinum-certified hospital in Chennai, Tamil Nadu – MGM Healthcare. Its genesis is a "health-caring movement", which redefines the patient experience across all parameters, through design, expertise, technology and environmental sustainability. Lighting was recognised as an imperative element in this



Corridors



Admin-Office

Project details

Location	: Chennai Tamil Nadu, India
Client	: Mahatma Gandhi Medical College & Research Institute
Architecture Green Consultants	: KGD Architecture : Conserve Consultants
Lighting design	: Lighting Research & Design
Luminaire supply	: Gojis Lifestyle + StudioPlus

Photographs**Gowtham Raj**

health-caring movement to support doctors and therapists during treatments, and promote the healing process in patients with an increased sense of wellbeing. The right light at the right time in the right place was considered critical in this movement characterised by acute cost awareness and savings as a result of lower energy costs. With a built-up area of over 300,000 sq. ft., this 11-floor 400-bedded super-specialty hospital is optimally designed to provide the most comforting ambience for healthcare. Every aspect of the hospital reflects an ethos of healing and a sense of serenity, from the city's tallest vertical garden to the use of music therapy in critical care areas, to thematic art galleries on each floor celebrating various facets of Tamil Nadu. These myriad tasks and the vastly differential spaces and users demanded a variety of lighting treatments without compromising energy efficiency. Although utility in terms of way finding was non-negotiable, there was a lot of latitude to experiment with in terms of brightness, colour temperature and colour rendering. However, one general principle followed throughout the hospital was to make the effect of the 100 per cent solid-state lighting as natural as possible so as to provide a better sense of wellbeing among patients and staff.

Lobby and VIP Lounge

The preliminary brief was to provide the functionality and style of a hospitality environment so as to elicit a certain emotional response from the hospital users. Therefore, the lobby had to be inviting yet professional to complement the furnishings and decor for creating an overall appeal. While a well-lit lobby was essential, care was taken not to flood it with overabundant illumination that might create environments akin to an emergency room. The lobby was divided into entrance, reception and waiting areas, with each area receiving its own lighting treatment to provide a different 'feel' for every area. The reception desk is well-lit and prominently highlighted with a decorative pendant in 3000K so that patients and visitors know exactly where to go first, and have adequate illumination for reading and signing necessary paperwork. The VIP Lounge is a waiting area specially allocated for important guests and visitors. The lighting solution was to create a relaxed and soothing atmosphere. Ceiling-mounted cylindrical 3000K downlights with adjustable heads provide accentuated illumination, which can also be used to highlight the paintings on the walls. Decorative floor lamps and wall-mounted up-downlights in 3000K are added next to seating areas to



enable guests lounge with a book or socialise. Gold-finish luminaires are specified to match the beige and gold colour scheme used in the entire lobby and lounge areas.

Corridors

Great care had to be taken while moving patients in stretchers or wheelchairs so as to avoid direct glare from the corridors lighting. Bespoke ceiling-recessed double-asymmetric linear profiles in 4000K 'wash' the two walls of the corridors to provide glare-free vertical illumination as well as enable way finding. For night-time use, these linear profiles can be dimmed using an analogue rotary-dimmer mounted on the entry walls of each corridor. Decorative pendants in 3000K highlight the nurse stations in all these corridors. In the executive floor corridors catering to the high-end suite rooms, circular coves with 3000K LED tape are used to provide soft warm illumination akin to a hotel corridor. Bespoke wall-mounted decorative up-downlights in 3000K provide supplemental illumination in all corridors.

Doctors' office

The doctors' offices combine the dual tasks of a regular office and an examination room. Office lighting has to be ergonomically correct and individually adaptable. Examination room lighting requires high levels of general illumination and good colour rendering to show the true tone of the skin for

visual examination and deciding the right treatment. However, since majority of the consultancy in a doctor's office consists of simply talking with the patient, soft general illumination was the best lighting solution. Modular panel luminaires in the modular grid ceiling were the best way of reaching the 500lux average requirement with a colour temperature of 4000K and high Ra 90 value.

Administration office

Direct indirect combined with task lighting provided the optimum-working environment for all paper and screen work in the hospital administration office. Decorative circular pendant luminaires of different sizes and configurations were used to create more intimacy and less of a clinical look. These luminaires were also selected to match with the exposed ductwork in the ceiling.

Cafeteria

When deciding how to light the cafeteria, it was important to determine the type of mood to be created based on its hours of operation. As this is a high-energy establishment with staff and visitors using the place 24x7, it required bright lighting to keep them awake and alert. The ambient and punctual lighting elements define the design and feel of this cafeteria. Large windows let in ample amount of natural light during the day, while the rhythmic composition of 'floating' 3000K linear



Landscape



Training-Rooms

Products applied

Bollards (Exterior)
Downlights recessed
Downlights recessed (Exterior)
Downlights surface-mounted
Downlights surface-mounted (Exterior)
Floor-lamps
Grazers
Modular Panels recessed
Pendants circular
Pendants decorative
Profiles recessed
Profiles suspended
Projectors spike-mounted (Exterior)
Spotlights recessed
Tape
Up-Downlights decorative

: K-LITE Anja 8W LED
: ABBY iKap 10W & 15W LED
: ABBY Bling 8W LED + Spa50 15W LED
: ABBY Look Around 10W LED
: L'AZURE Vibrance 30W LED
: LEDS-C4 Premium 3x10W LED E27 Retrofit
: ABBY iGraze 40W LED
: ABBY Skylight 36W LED
: ABBY Circulo 50W & 80W LED + Enso 50W & 100W LED
: AROMAS Cube 40W, 45W, 55W & 75W LED
: D-Lite 30W, 60W & 90W LED
: ABBY Inline 15W & 30W LED
: K-LITE Trioscope 7W LED
: ABBY Luke 3-Way 3x10W LED
: LEDOS 14W/m LED
: ASTRO Rio 6W LED + TPT Wall 8W LED

profiles integrated between the wooden rafters provide illumination at night.

Training rooms

The training rooms for conducting special training sessions for doctors also doubles up as an auditorium for hosting major conferences. Therefore these rooms were much more than spaces where doctors come to sit and learn – they're dynamic environments where people meet, learn, share ideas and collaborate. In order to provide such flexibility, lighting has been designed for easy pre-programming and dimming. Ceiling coves with LED tapes in 4000K provide ambient illumination to eliminate glare and fill in the shadows on faces so that people look well. Additional spotlights in 4000K provide accentuated illumination.

Green wall

The pre-function area outside the training rooms features the city's tallest vertical garden in the form of a living green wall. Although the large skylight allows ample natural light required for photosynthesis, supplemental illumination was required for those sections of the wall not receiving the required illumination. Additionally, the living wall becomes a night-time feature especially during conferences, hence required special highlighting. Linear grazers in 4000K were used from the top-downwards and below-upwards to evenly wash the green

wall. Rest of the lighting in the pre-function area was kept to be bare minimum to maintain focus on the green wall.

Façade and Landscape

With the aim of becoming India's first USGBC LEED Platinum-certified hospital, the criteria were fairly clear with respect to minimising light trespass from the building and site, reducing sky-glow to increase night sky access, improving night-time visibility through glare reduction and reducing development impact from lighting on nocturnal environments. Minimal lighting is provided to highlight the façade patterns and low-level bollards are used to provide glare-free exterior lighting.

Few hospitals have a perfect lighting system, as the lighting demands are complex, and the need is for unique solutions that benefit both staff and patients. MGM Healthcare has strived to realise its motto of providing better health with lighting as one of the key elements. ■



Author

Dr. Amardeep M. Dugar,
IALD, MIES, MSLL, Founder & Principal,
Lighting Research & Design



Lighting Industry & Need of Continuous Education

To be a true asset in today's ever-changing environment, individuals who are equipped with a multi-tiered skill set is the need of the hour, observes renowned lighting designer, educator and consultant Anil Valia

The Industry Trend

The introduction of LEDs and advancements in solid-state lighting (SSL) over the past 15 years, the LED technology has essentially replaced nearly every "conventional" light source for the vast majority of applications on the ground – most energy efficient Light Source. Everything is LEDs. Yes, it is energy-efficient source. LED has won!

However, lighting is deep into a transition toward technology- and electronics-based industry. It has now led to the re-examination of fundamental technological issues – colour, flicker, dimming, brightness, glare, optics, controls and also lighting quality metrics and new performance criteria.

While the pace of change in the source technology is starting to plateau up to some extent, the applications are really starting to expand. Non-traditional applications will include lighting for horticultural. Further there is an explosion of interest in the so-called 'nonvisual' aspects of lighting, precipitated in large part by the discovery of the ipRGC photoreceptors at the turn of the century, leading to lighting for potential health benefits or effects, circadian and beyond. It should begin to see increased implementation of human-centric lighting.

Other technologies are at the edge of breaking through and should begin to see increased implementation – Internet of Things (IoT). Lighting is not just lighting anymore. Dubbed 'beyond lighting' capabilities lighting as a platform is emerging as a model for deploying additional services. Li-Fi is another segment that is prepared for advancement.

Now networked lighting controls (NLC) – a technology advancing at a lightning speed where energy savings are only part of the NLC equation – and a probably a less important one for today's companies. IN USA the "3-30-300 rule" holds that businesses now spend just \$3 per square foot on energy, versus \$30 on real estate costs and \$300 on employee salaries and benefits. With that in mind, it is easy to understand why companies may be less interested in a technology's energy savings potential than in its capacity to make employees happier and more productive. Giving office, medical, and academic buildings a "brain" that can yield those results – and networked lighting provides a gateway to that building intelligence.

Outdoor road lighting is one of the largest, most energy intensive elements of city infrastructure, and is rapidly converting to LED technology. Streetlights are an ideal location to deploy connected technology solutions, to make the vision of the smart city a reality. Adding wireless controls to LED conversion projects saves money, improves service levels and provides sophisticated lighting adaptation and automation. Connected street lighting serves as the gateway to a range of smart city applications, from traffic analytics to air quality.

Complex LED Lighting Business

The LED lighting business is complex as compared to past traditional light source technology where it was possible for any least educated person to fabricate and assemble luminaires. However, with LEDs not being standalone light source, call for knowledge or with skill sets in thermal, optical and mechanical design, and electronics or electrical engineering, software etc. Similarly, in sales or marketing of LED luminaires, sales people with no additional skills as needed today seem to be non-performing assets.

Lighting industry will need to have more experts in these fields if these innovative technologies are to materialise on a widespread scale and take root. The industry's major leaps forward are rooted in scientific discovery. The manufacturers will start to incorporate more individuals from the IT sectors and various fields of science. Similarly, for marketing skilled people will be needed in lighting controls from automation to building integration, and in health and wellness from enhanced medical environments to circadian lighting developments.

Need of the Hour

To be a true asset in today's ever-changing environment, individuals who are equipped with a multi-tiered skill set is the need of the hour. As there is a movement toward improving the built environment by making spaces more productive, and

lighting can play a key role in this evolution, skills in understanding some of the new lighting application requirements will be the need of the hour.

Smart cities and building owners looking to better leverage their energy assets, there will be need for tech-savvy individuals, with high level of broad technical expertise specifically controls professionals, and data management. One will have to be creative problem-solvers who can be flexible to adapt to the continually changing needs and developments in lighting industry.

However, control people being non-lighting professionals need training in lighting field is the need of the hour. Similarly lighting people need to understand and upgrade their other skills say in control.

How to Develop the Additional Skills

A company's environment, culture and benefits are things that can really attract the most talented lighting people. Work environment should be such that they are respected, appreciated for the work and have the opportunity for growth. But to attract and hire new employees and keep the talented people there need to have the strategy. One of them is to identify the development of skill in lighting, control and associated fields.

Conclusion

Being first qualified Lighting Person in India from UK way back in 1973, having spent more than 45 years in practically all areas of lighting field like manufacturing, product development, quality control, lighting design, supporting sales staff for order conversion except direct sales and most important - training and developing skills in lighting of staff at all levels, and also under the banner of International Lighting Academy since last 25 years, the author claims that as there is no formal education available in lighting field. Lighting companies will have to provide such knowledge for their new and existing staff through continuous educational training courses in field of LED light and lighting including control and human well-being. This responsibility lies with HR Department and CEO of lighting division of large organisation and owner of mid-level and small-scale lighting division.

Many from lighting industry and now new entrants in LEDs business in India have misconception that such training is expensive. But the author says that spending - in fact investing, just 1 per cent of their turnover or one person's one-month salary for skill development can improve their business in future! ■



Author

Anil Valia

- Lighting Designer, Educator & Consultant
- Author of Designing With Light – A Lighting Handbook
- Lighting Systems Consultant



LIGHTING A DOCTOR'S HOME

Located in a plush neighbourhood of South Delhi, Dr. Chandana's residence is a recently completed project by Anusha Technovision Pvt Ltd. Spread across two floors ((ground and basement) and over 4,000 sq. ft. approximately, the home automation brief necessitated lighting controls, automation systems, an audio video system and a security system.

At Dr. Chandna's Residence in Delhi, Anusha Technovision has played the vital role by installing the lighting controls, motorised shades, speakers, step-up of home theatre and everything can be controlled via iPad. The lighting control system installed in this residence creates the ability for home's lighting to be controlled together.



The idea was to create a contemporary, luxurious space for which Anusha Technovision Pvt. Ltd. played the tech-savvy role of setting up the lighting controls, motorised shades, speakers, and home theatre where everything was accessible through an iPad. Driving the design scheme with simplicity, the enthralling experience of the house begins with the living area whose beauty gets augmented with a palladium keypad. The keypads allow the control of lights, shades/drapes and HVAC from one location, providing the optimal user experience. The room fills up with ample amount of natural light which can be controlled or enhanced with the motorised shades and a lighting control system.

Adjacent to the living area is the dining hall where the lighting controls and music from the ceiling speakers add to the overall mood and enhances the dining experience for the family members. The three bedrooms are fitted with occupancy sensors for energy saving. The occupancy sensors sense the motion in the space and automatically turn the lights on and off. There are three types of lamp load, wattage and a dimming protocol available, provided with three types of Lutron Modules which are 230V Direct Dimmable Module, Switching Module and 0-10V Analog Dimming Modules for Cove lighting. Seven wired palladium keypads are wall mounted (with customised engraving) are used to control lights, curtains and the fan.

As one comes down to the basement, the mood lighting accentuates this area to make the bar and party area dynamic and interesting. The sound from the in-ceiling speakers add to the overall vibe of the space. The palladium keypads merge aesthetically with the wall. The automation fully integrates the lighting and shading control system. The integrated iOS or Android device allows the user to control all the functions of the lighting substituting the functions of the lighting keypads.





The lighting control system creates the ability for the home's lighting to be controlled together. Convenience is the primary benefit of owning a lighting control system, but there are several other benefits as well. Home security systems can be enhanced by controlling the lights during an alarm situation, turning on to full brightness inside the home and flashing outside to quickly identify the troubled home for the authorities to notice. Built-in time clock capabilities allow all the lighting in your home to be automatically controlled and simulate occupancy while you are away, deterring potential intruders. ■



5 IDEAS X 5 AREAS

"The number 5 has many connotations – it speaks of completeness when you think of skill and dexterity of the 5 fingers and 5 toes; it imparts balance when all the 5 senses of your body align; it exhibits force when the 5 elements of nature unify; it delivers change when you travel through the 5 phases of life; but above all the number 5 stands for versatility as it can be used to classify, summarise and unite the various differences around us..."

This ACETECH, Häfele takes an inspiration from the many facets of the number 5 and applies the "5 x 5" rule to your home improvement needs.

LOOX5 – the 5th Generation of Furniture Lighting Solutions from Häfele

Have you ever imagined a home that exists in complete absence of light; where your surroundings are just a vague concoction of black contours; where a vibrant red and a radiant blue look like mere shadows of grey; and the only experiences you have are by touching things around you? Can you imagine a home without light? If not, then how can you live with similar dark corners within your kitchen drawers, or lustreless showcases that stand unnoticed in your living room, or vibrant clothes and accessories that all look grey in your un-lit wardrobe? The

importance of light within furniture cannot be undermined; it has the same relevance in your day-to-day routine as regular ambient lighting in your homes.

Häfele understands furniture and all that goes with it. The company also understands the importance of home ergonomics, lifestyle conveniences and ease of mobility within your surroundings. Years of tradition, research and technological development have led Häfele to believe that furniture units are optimised to their highest use when the right corners and surfaces within them are adorned with the right type of lighting.

This ACETECH, Häfele launches its 5th Generation of Furniture Lighting Solutions – Loox5 that encapsulates the essence of four generations of lighting systems that have redefined home ambience and ergonomics over the last 10 years.



Loox5 takes lighting to the next level. Inspired by the demands of time, Loox5 makes lights easy, logical and linear. These lights have not just been designed but in fact have been engineered keeping the utmost comfort for the consumers in mind. The range presents itself as a unique combination of elegant design and state-of-the-art technology making it the perfect choice for any home furniture application; be it task lighting for kitchen cabinets and plinths, decorative lighting for living room showcases, mood lighting for bedroom applications or pure functional lighting in wardrobes.

Come and see the first showcase of two new products from the Loox5 range at the Hafele Booth, this ACETECH:

Loox5 LED Strip Lights

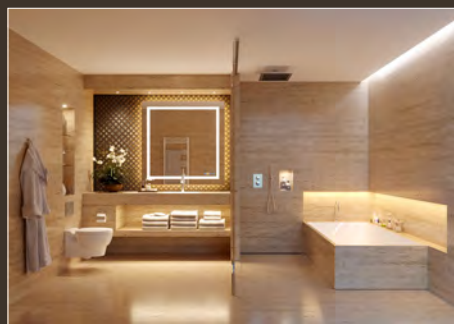
The Loox5 Strip Lights, equipped with Samsung LEDs, enhance the light quality for a homogeneous light distribution, ensuring a

uniform colour temperature across the entire system. With the help of these strip lights, you can create an exquisite ambience in your bedroom, open kitchen, living room or simply wherever you want. They provide radiant task lighting to illuminate the work spaces as well as discreet ambient lighting for wellness zones. A life time of 50,000 hours is guaranteed.

Loox5 Aluminium and Plastic Profiles

The Loox5 Range of Light Fittings include a large selection of recess mounted and surface mounted profiles on which you can mount the Loox5 Strip Lights. These profiles come in high-quality trendy finishes of silver and black for top-of-the-line design demands. They virtually blend into or complement your furniture to provide a glare-free light source. ■

For more details, visit www.hafeleindia.com



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 one of the leading manufacturers 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.

K-Lite's 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. ■

For more information, contact: info@klite.in

Website : www.klite.in



OPPLE SMART LIGHTING SOLUTIONS

OPPLE has introduced its range of flicker-free LED lighting solutions in the Indian market to prevent many flicker-related LED issues, leading to health hazards to the users.

Here is what OPPLE has introduced to the Indian market:

- **Smart O:** With a unique name, Smart O boasts its unique design and functionality as well. It is a flicker-free LED table lamp, which comes with an in-built speaker. The Smart O is a 7-watt LED set up that serves the purpose of a table lamp and wireless music player at the same time, owing to its Bluetooth connectivity. It has 16 million colours, controlled via its dedicated smart app through mobile phones. Smart O can function on time-based actions as well, with setting the time in its app turns on or off the lamp, as required.
- **OPPLE Sensor Bulb:** OPPLE Sensor Bulb is an infrared-based device that uses proximity to function. It is an LED bulb fitted with an infrared sensor that detects movement. When a person comes in its proximity, it automatically turns on and stays on for a certain duration after the area is left vacant. This technology enables saving electricity that is being wasted by leaving numerous light sources across the living areas.
- **OPPLE Radar:** Another energy efficient solution by OPPLE, the Radar is a motion sensor LED light that detects human motion to function. It can save up to 59 per cent electricity, compared to the traditional light solutions and serves ideally for homes, offices, gyms and washrooms, the company claims.
- **JBL OPPLE Light:** The JBL OPPLE Light is a flicker-free smart LED ceiling light, fitted high-performance JBL speaker and controlled by remote. With Bluetooth connectivity, this LED light connects with laptops and cell phones with ease to play desired music. The JBL OPPLE



Light is fitted with warm and cold light, and functions with low energy consumption. ■

For more details, visit www.opple.com

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SINGLE PHASE / THREE PHASE HIGHLY INSULATED FRP EARTH / DISCHARGE ROD

MODEL - 11KV / 33KV / 66KV / 132KV / 220KV / 400KV

“KUSAM-MECO” has introduced Single Phase or Three Phase Fibre Glass Discharge / Earth Rod. They are supplied in a wide range of ratings 11 / 33 / 66 / 132 / 220 / 400KV.

They are used to discharge Electrical Systems having limited fault levels.

FEATURES :

- **Rods** : Single Rod (1 Phase); 3Nos. Rod (3Phase)
- **Material** : FRP Pultruded.
- **Process** : Automatic Pultrusion Plant.
- **Surface** : Smooth and Glossy.
- **Design** : Telescopic Type.
- **Locking** : Push Button type Locking System.
- **Total Section** :
 - 03 Section (11KV, 11-33KV, 132-220KV)
 - 04 Section (33-66KV, 66-132KV, 400KV,)
- **Assembled Length** :
 - 15 feet Length. (11KV, 11-33KV)
 - 16 feet Length (33-66KV), 18 feet Length (66-132KV, 400KV)
- **H.V.Test** : 110 KV , 400 KV(132-220KV)
- **Glass Content** : 65 %.
- **Top Section Dia** : 25 mm.
- **Bottom Section Dia** : 45 mm.

- **Earthing** : Die cast Alu. Earthing instrument for 30mm Dia (11KV, 11-33KV) Die cast Alu. Earthing instrument for 50mm Dia (33-66KV, 66-132KV, 132-220KV)
- **Cable** : 4sq. mm copper cable 06 mtr. long. (11KV)
6sq. mm copper cable 06 mtr. long. (11-33KV)
10sq. mm copper cable 07 mtr. long. (33-66KV)
16sq. mm copper cable 08 mtr. long. (66-132KV)
25sq. mm copper cable 10 mtr. long. (132-220KV)
16sq. mm copper cable 10 mtr. long. (220KV)
35sq. mm copper cable 10 mtr. long. (400KV)
- **Clamp** : Crocodile grounding clamp.(11KV, 11-33KV)
Aluminium “C” grounding clamp. (33-66KV, 66-132KV, 132-220KV, 220KV, 400KV)
- **Cover** : At extra cost / Optional



SINGLE PHASE THREE PHASE

TO VIEW THE FULL DETAILS OF EACH PRODUCT VISIT : www.kusamelectrical.com

G-17, Bharat Industrial Estate, T. J. Road, Sewree (W), Mumbai - 400 015. India.

Tel. : 022-27754546, 24156638, 24124540, 27750292 / 0662

E-mail : sales@kusam-meco.co.in

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XDPL8221 - Digital, configurable multimode flyback controller

Start designing versatile, high performance LED drivers

With Infineon's newly launched XDPL8221 the driver will no longer be the "weak link" in an LED luminaire design. To the contrary, with the XDPL8221 you will design cost-effective dual-stage drivers with advanced features that are safe, reliable and robust, as well as efficient.

Features in the spotlight

- > Combining a quasi-resonant PFC and a quasi-resonant flyback controller with primary side regulation
- > UART communication interface with command set for accessing real time operating parameters and numerically precise dimming control
- > Configurable protection mechanisms (undervoltage, overvoltage, open load, output shorted, brown-out and brown-in)
- > Supporting full functionality for AC and DC input (nominal input voltage range: $100\text{--}277\text{ V}_{\text{AC}}$, $127\text{--}430\text{ V}_{\text{DC}}$)
- > Built-in digital control selecting best mode of operation (quasi-resonant, discontinuous conduction or active burst mode)
- > Multi control featuring constant voltage, constant current and limited power as configurable operating parameters
- > Flicker free dimming (down to 1% of nominal current) plus dim-to-off function (low standby power $<100\text{ mW}$)

Designers are invited to assure themselves of the XDPL8221's performance by using one out of two available reference designs (REF-XDPL8221-U50W, REF-XDPL8221-U100W).

Target applications:

- > Flicker-free LED driver for indoor or outdoor applications
- > Multi-mode LED driver for connected lighting
- > Wired or wireless connected LED driver



HÄFELE

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Bluetooth Capable
Transducer System



Background Lighting



Demister (Mirror Heater)



Front Lighting

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Bangalore - Tel.: 080 4132 6116 | **Hyderabad** - Tel.: 8886063780 | **Pune** - Tel.: 020 2563 330 | **Chennai** - Tel.: 044 4858 5525
Mumbai (SOBO) - Tel.: 022 6264 7100 | **Mumbai (Bhandup)** - Tel.: 022 2596 9660 | **Kolkata** - Tel.: 033 4008 6814 | **Delhi** - Tel.: 011 6657 4999

Customer Care Toll Free: 1800 266 6667 | Customer Care Whatsapp: +91 97691 11122 | Email ID: customercare@hafeleindia.com | Visit: www.hafeleindia.com | SMS 'HÄFELE' to 56070