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JAN - MAR 2024

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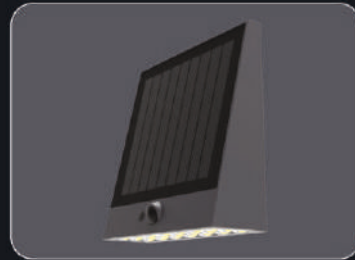
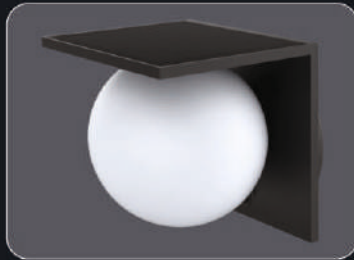


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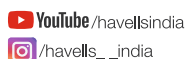
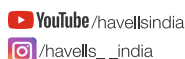
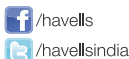
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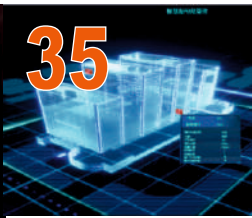
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# A Fresh Start

As we bid farewell to a year brimming with events, I embark on a new chapter in 2024 as the Secretary General of ELCOMA and Editor of Illumination. With this journey ahead, I extend my warmest wishes for a joyful and prosperous New Year to you and your families.

While 2023 brought a rollercoaster of challenges and triumphs for the Indian Lighting Industry, market insights suggest that 2024 holds promise for the professional segment, even as the consumer market navigates hurdles. As our nation's GDP is projected to grow at 6.5%, the lighting industry is poised for an even brighter ascent. We encourage all our members to embrace this potential and leverage our manufacturing prowess to make India a global hub for both production and export in the years to come.

Looking back, 2023 was a year of immense excitement and fulfillment for the Illumination team. The magazine has witnessed a surge in popularity, earning accolades not only from our valued members but also from esteemed bodies like BIS, DPIIT, BEE, and international associations like ISA and GLA. We express our deepest gratitude to every member who has enriched our pages with their contributions.

We've had the privilege of featuring ELCOMA members on cover pages and showcasing their lighting projects, underscoring the brilliance of illumination solutions in our age of smart technology. Our pages have also been graced by the knowledge and expertise of the industry's brightest minds, sharing insights on technological advancements, best practices, and design innovations. To each contributor, we offer our heartfelt thanks. We look forward to your continued collaboration in solidifying Illumination's standing as a valuable resource.

Finally, my heartfelt appreciation goes out to all our members and readers who have made Illumination a success. Your support fuels our passion for planning and achieving even greater things in the year ahead.

Best Wishes for 2024 !

A handwritten signature in black ink, appearing to read 'Amal Sengupta'.

**AMAL SENGUPTA**

Secretary General

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# A Brighter and Sustainable Future

**D**ear Esteemed Members of ELCOMA,

I extend my warm greetings to each one of you.

It is an honor and privilege to address you as we navigate the dynamic and fast changing landscape of the lighting industry. We look back at 2023 for being dynamical and tumultuous in many ways. But I sincerely hope that the year 2024 would be more promising for businesses at large, especially for our lighting industry.

In the realm of macroeconomics, India continues to shine. The steady growth and resilience exhibited by our economy reflect the collective efforts of domestic industry and the nation at large. With some interesting strategic initiatives in place, we stand at the threshold of unparalleled opportunities. It is crucial for us, as stakeholders, to align our strategies with the prevailing economic trends to ensure sustained success.

The rapid evolution of technology, especially the advent of Artificial Intelligence (AI), is reshaping the contours of our industry. As we strive towards ELCOMA's Vision 2030, it becomes imperative for us to embrace these transformative technologies. AI, coupled with IoT, smart, and connected lighting, is not just a trend but a fundamental shift that can redefine the future of lighting solutions. I am sure that we all are exploring and integrating these technologies into our businesses, ensuring that ELCOMA remains at the forefront of innovation and sets the standards for the industry. As one of ELCOMA's endeavours to provide a common platform for technological minds coming together, we have plans to organise conferences on Hospitality, Digital LED lighting, Health care, Connected lighting systems throughout the year 2024.

I take this opportunity to express my appreciation to the ELCOMA Secretariat for their unwavering commitment and dedication towards their work. Not forgetting our tech writers! Your brilliant & insightful articles have elevated our IllumiNation magazine to new heights, making it a beacon of knowledge for our industry. It is heartening to witness the collaborative spirit that defines ELCOMA, and I encourage each one of you to continue sharing your expertise for the benefit of our collective growth.

As we embark on a new year, filled with possibilities and opportunities, I extend my heartfelt New Year greetings to all members of ELCOMA. May the coming months be marked by prosperity, innovation, and shared success. Let us continue working together to illuminate the path toward a brighter and more sustainable future for our industry.

Warm regards,



**AVINDER SINGH**  
President, ELCOMA







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# Innovation and New Technologies Will Drive the Indian Lighting Industry

Illumination editorial team in conversation with Mr Anuj Poddar, Managing Director & CEO, Bajaj Electricals Limited on how the company is charting its future and meeting present-day challenges.

**In one of your earlier interviews with ILLUMINATION, you mentioned that your decision to move to Bajaj Electricals was to take up the challenge of steering a large ship and doing so in a very competitive marketplace. How far has this been successful?**

I would answer this in two parts. Firstly, given the sheer scale and complexity of the challenge, it was daunting in many ways. Due to our own internal issues as well as a competitive environment and the pandemic that ensued to turnaround a large, legacy organisation that is into multiple businesses and is also a publicly listed company with so many stakeholders, was not easy. Fortunately, we have been successful in our endeavours and have re-invented the company.

Secondly, and more importantly, success has its own pitfalls. Many of our stakeholders have swung from being cynical about our ability earlier to having over-expectations now. We have a long way to go and many things to fix and to improve upon. It is a journey. We remain on that path and will continue to evolve into a stronger organisation, driven by excellence.

I would like to highlight that it is the belief and backing of the promoter, Mr. Shekhar Bajaj, that has been crucial in enabling me to take risks, make aggressive decisions and deliver.

**Has being a Chartered Accountant and with your varied experience in different domains helped you accomplish your role in leading Bajaj?**

My journey to where I am today began

with a solid foundation through education. Chartered Accountancy is a much under-rated qualification that provides a strong financial acumen, coupled with the habit of discipline, as the process of becoming a CA itself is very rigorous. I began my career with Arther Andersen which instilled professionalism into me – excellence, hard work and intellectual honesty were our trademarks. Ten years of consulting, across a wide set of clients and sectors, provided the framework of being able to analyse various businesses and organisations and problem-solve to create value. Thereafter I spent over 13 years in the Media and Entertainment business dealing with some of the most iconic brands which taught me about brands, marketing and understanding consumers.

The legendary NFL coach Vince Lombardi has said, “Leaders are not born, they're made.” And as clichéd as it sounds, it's true. I am a culmination of all the experiences that I have gained. I am fortunate to be able to bring those to bear for the benefit of our company in the form of my current role.

**How does the lighting business of Bajaj Electricals compare with other Consumer goods businesses of the company?**

The Lighting Solutions business and the Consumer Products business are very different from each other in terms of competitive ecosystem, technological evolution and the success factors and the role of the brand. As a company, Bajaj Electricals was much more known for its lighting business some decades ago – due to its iconic marketing campaign and jingle of “Jab mein chhota bacha

tha...”. Since then, our Consumer Products business has grown considerably, while we lost our way somewhat in the Lighting Solutions business, albeit remaining a key player. Currently our Lighting Solutions business contributes to about one-fourth of our revenues.

Having said that, over the past couple of years we have been refocusing on our Lighting Solutions business – both B2B (professional) and B2C (consumer). Our professional lighting business includes poles, high masts, street lighting, area lighting, landscape lighting, façade lighting, infrastructural lighting, commercial lighting, etc. We are front runners in stadium and metro lighting and have recently completed marquee projects like the Birsa Munda Hockey Stadium, Rajkot Cricket Stadium and the Agra, Pune and Delhi metro projects. Our consumer lighting solutions include LED lighting products such as bulbs, battens, energy efficient ceiling lights and smart connected LEDs. We expect to continue to scale up both, our B2C and B2B lighting business.

**What is the Roadmap for Lighting at Bajaj Electricals in the coming few years?**

In the lighting industry technology changes very swiftly, and the products have to evolve every 6-8 months. At Bajaj Electricals, we aim to place meaningful innovation at the heart of what we do, to offer a robust portfolio to our consumers and in the process create value for our stakeholders. We have one of the best R&D capabilities in our industry, within India. We're working on identifying and building various platforms that will help us fortify our

position in the lighting business; and accordingly, we have ushered all our support functions to create the portfolio for such products. The rapid growth of the ceiling lights category presents opportunities to capitalise on the rising consumer involvement and establish ourselves as the preferred brand. In the Professional Lighting segment, we want to strengthen our façade lighting, solar and landscape lighting portfolio. We see emerging opportunities in city beautification projects. Additionally, we will concentrate on sunrise sectors and industrial projects like sports illumination, national roads, metros and airports, and industrial and warehouse lighting in the upcoming years. BAJAJ delivers cutting-edge LED lighting solutions with smart lighting options for the current and expected requirements.

### **Present day lighting landscape is seeing a shift from energy efficient products to Smart / Connected lighting. How is Bajaj Electricals embracing this change?**

In the B2B segment, customer preference is slowly changing towards connected lighting solutions. Such solutions offer new ways to control, manage and measure the impact and efficiency of lighting in spaces. These systems also deliver savings on maintenance and energy consumption. BAJAJ has a first-mover advantage in providing smart city solutions through our CITISOL smart lighting platform that enhances the quality of life and improves services and security eventually creating value for the customer. We have already installed more than 5 lacs smart streetlights on this platform in various smart city projects across India.

On the other hand, in the consumer lighting space, we have robust plans to have IOT products across various subcategories in lighting. IoT lighting is still in the nascent stages as the business in terms of adoption. We expect that with increased awareness levels, the business of these products across sales channels will start picking up at a substantial rate in the times to come.

### **We get to learn from other members about the challenges faced in consumer sales. What is your opinion on how such challenges can be mitigated?**

The industry has seen a lot of value erosion owing to a drop in costs and prices. This can be attributed mainly to a technology shift from driver-based products to DOB-based products. In my opinion differentiation and a healthy product mix is the key to mitigating the risks associated with such challenges. I also strongly believe that not all price erosion is in the interest of consumers – a lot of it is accompanied by quality erosion due to extreme competitive pressure. And it also dissuades brands from investing in quality as well as innovation. As an industry we need to focus the conversation on quality and innovation to help consumers make better choices that provide them with a truly superior proposition.

### **What are your views to ELCOMA's Vision Document where we aspire to make India an export hub for Lighting products and capturing at least 10% of the Global Lighting market by 2030?**

I believe that the Indian lighting industry has the potential to step up to realising this goal and vision. We have the benefit

of scale from a large domestic market, we have serious, well-established local lighting players and we have the manufacturing capabilities. With the right policy support, enabling environment and investments in innovation, we can get there. The first two points require the industry to work with the government. While the government is signalling the intent to be a catalyst, we hope to see greater on-ground execution towards ease-of-doing-business through easier, frictionless compliance. Furthermore, the organised, quality-focused players need governmental support and action against the unorganised players that skirt compliance and standards to undermine the efforts of the former players. This in turn, will enable and encourage us to focus on innovation and high quality, which are essential for us to not just gain a higher share of the global markets but also better serve our domestic market.

### **In the past, we did see the Ministry of Power through EESL enhancing the speed of quantum of LEDification in India, through initiatives taken by ELCOMA. What would you like the role to be played by ELCOMA for the enhancement of Connected Lighting in India?**

India has been making strides in smart city initiatives with Connected Street Lighting being a significant part of this transformation. The implementation of smart lighting systems in India involves the use of technologies like the Internet of Things (IoT) and sensors to make street lighting more efficient and responsive. Several cities in India have initiated pilot projects and full-scale implementations of connected street lighting. The adoption of these



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## CAPTAIN SPEAKS

technologies contributes to the overall goal of building more sustainable and technologically advanced urban environments. ELCOMA being the apex organisation representing the lighting industry, will play a key role in helping build quality standards and product specifications for a correct choice for any user, thereby helping the adoption and scaling of such connected lighting applications in India. ELCOMA can work along with EESL, and the Ministry of Urban Development who drive smart city missions across the country for faster implementation of connected lighting in public places and standardisation of specifications. It can be a bridge between industry players offering smart and connected lighting solutions and urban infrastructure managers.

### **What is your opinion on the significant non-compliant LED Lighting market that ELCOMA has been continuously highlighting this to the Government and the regulators?**

It is a known fact that non-compliant Lighting solutions pose a serious threat to the lives of the end users. I would urge all players to invest in raising awareness about compliant vs non-compliant products. A more informed consumer will be able to make the right decision while selecting/ buying a product. As a parallel activity, law and enforcement bodies must also continue to be vigilant to ensure non-compliant products and their manufacturing are curbed to the extent possible. As I said earlier, this is critical for the government to ensure, for the betterment of not just industry, but the consumers and our nation.

**Post pandemic, the lighting industry is back on the growth path. Where do**

### **you think the lighting industry will be in the next 5 years?**

The impact of the pandemic has concluded and the lighting industry is gradually moving towards the growth path in most sectors. The current demand scenario for Consumer Lighting is sluggish and LED prices are eroding. On the other hand, due to the impetus of the government in infrastructure development and renovating public places, we have seen a rise in projects in the Outdoor Lighting segment. National Highways, Tunnel lighting, Sports lighting, Metro networks; similarly architectural and façade lighting have shown visible growth in the last two years. Post the pandemic, investments in industrial and commercial segments were slow starters but now from this financial year, we are beginning to see green shoots mainly in industrial workspace lighting. This demand is driven by the need to bring operational efficiency through the LED fabrication of existing factories. We expect growth coming back to commercial space lighting in the coming months as most companies in the

IT and BFSI sectors have gone back to office work and started investing in new office spaces.

### **What are your views with respect to the current pricing strategies and growth plan considering that bulb and batten pricing is down by over 20% in the last 2 quarters?**

The favourable movement of commodity prices and changes in LED technology have made it possible for lamps and batten pricing to be at the lowest ever. In my opinion while some of this price reduction is led by the above factors, it is exacerbated by hyper-competition that is unsustainable. Not only does it affect the viability of business, especially of the organisations that conduct business ethically and in full compliances with standards and regulations, but it also erodes quality and the capacity to invest in R&D. That said, we need to continue to move the narrative towards greater differentiation of products, quality and innovation. That would be greater win-win for the consumers as well as industry.

## IN A LIGHTER VEIN

### **How do you spend your free time?**

What free time? Whatever little spare time I have, I like to spend it with my daughters as well as indulge my penchant for design and a couple of other non-commercial entities that I am involved with.

### **What are your hobbies?**

Design. Music

### **Which is/are your favourite book/s?**

The Kite Runner by Khaled Hosseini; and The Book Thief by Markus Zusak

### **What is your favourite food/cuisine?**

Asian. Vietnamese.

### **What is your favourite Holiday Destination?**

Small towns in Europe. Or the countryside in England

INTERVIEWED BY ILLUMINATION  
EDITORIAL TEAM

# Lighting Innovations Illuminating the Future

Radhika Opto Electronics Limited has roots dating back almost 4 decades and has come a long way since its humble beginnings. The company started off making conventional lighting fixtures for Crompton Greaves and steadily grew its operations till 2012 where it reached an inflection point with the advent of commercialized LED lights after which the company grew at a rapid pace. We had the foresight to see how disruptive this new technology would be and we decided on capitalizing on this opportunity. Driven by our visionary approach, relentless hard work, exceptional teamwork and uncompromising ethical standards, we constantly added new and innovative products to our portfolio and expanded our customer base to reach all major LED brands of India.



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# Leading Innovation and Change

The Illumination team recently had a chat with Mr. Ranbir Mehra, Director of Jaquar Lighting, to delve into how the company strategically incorporated lighting manufacturing and research and development (R&D) to establish itself as a prominent player in the Indian market.



### **How did the LED lighting journey begin for Jaquar, earlier known as a brand predominant in the area of bathroom fittings?**

Jaquar, renowned for its expertise in bathing solutions, transcends being a mere name; it stands as a powerhouse of exquisite craftsmanship, cutting-edge technology, and an unwavering commitment to quality. Our massive manufacturing facilities, equipped with state-of-the-art machinery adhering to international quality standards, propelled Jaquar to global recognition as a bath brand par excellence. With the advent of LED technology, Jaquar recognized an opportunity to extend its prowess into complete lighting solutions across various segments. This seamless addition, rooted in the fundamental needs of both water and light, showcases Jaquar's dedication to providing an aspirational product experience that transcends mere functionality. The might of Jaquar as a bath brand and the introduction of lighting solutions from its house speaks volumes about the stringent quality standards it upholds, further solidifying its position as a leader in the industry.

### **The LED lighting manufacturing facility shifted from the iconic landmark facility in Manesar to Bhiwadi. What transpired to make this shift in the manufacturing base?**

While our initial foray into manufacturing lighting products took place at the Manesar facility, it soon became apparent that achieving our goal of offering comprehensive lighting solutions necessitated a larger and more advanced plant. Serving as a proud advocate of the government's 'Make in India' initiative, Jaquar's state-of-the-art LED plant is now a fully automated facility, covering an expansive area of 55,000 sq. m. This significant expansion is highlighted in our latest plant video, emphasizing our commitment to excellence. The advanced facility boasts

various capabilities, including in-house ROHS-compliant LED driver manufacturing, an NABL-accredited lab, LED module manufacturing units, powder coating machines, and pressure die-casting machines. In setting these new benchmarks, Jaquar's lighting plant stands as a testament to our dedication to innovation and industry leadership.

### **The present-day lighting landscape is seeing a shift from energy-efficient products to Smart/Connected lighting. How is Jaquar preparing to adopt and build on this change through its innovation and market strategies?**

Jaquar Lighting is adapting to the evolving world of smart devices by introducing next-generation products designed to minimize human touch and enhance hygiene. Our range includes Bluetooth and Wi-Fi-operated bulbs, emergency lighting with in-built batteries, motion-sensing and color-changing products. These innovations align with the changing consumer landscape, providing efficient, time-saving, and energy-saving solutions.

### **At present, which market segments does Jaquar Lighting operate in?**

As a complete lighting solutions provider, Jaquar operates in every segment where LED lights can be offered. From bulbs and battens to decorative lights, outdoor solutions, smart products, and custom-designed requirements like façade lighting, we aim to provide the best available lighting solutions tailored to customers' needs.

### **Artificial Intelligence (AI) and applications related to AI are one of the driving forces behind the advancement of the lighting industry. How is your Innovation team planning to bring about this change in lighting solutions?**

Artificial Intelligence is rapidly evolving, and Jaquar Lighting is integrating AI in product design, allowing for automated lighting layouts

based on building models. AI systems also analyze data for adjusting lighting settings based on factors such as occupancy, ambient light, and energy consumption. This results in significant improvements in product design and energy efficiency.

### **We understand that the consumer business faces stiff challenges from competition. How do you plan to combat this situation?**

In a world of stiff competition, Jaquar approaches the lighting segment by prioritizing customer needs. By placing the consumer at the center of product development and service offerings, we aim to provide a superior experience at every step of the purchase and ownership journey. Customer advocacy is key to our continuous growth in the market.

### **You mentioned manufacturing facilities for MCPCBs and other components. Do you have plans to expand these facilities to enhance the localization drive in the lighting industry?**

Jaquar takes a proactive approach to business, thinking ahead of market realities. As a firm believer in India's manufacturing capabilities, we are open to expanding or setting up new facilities to cater to both Indian and global markets as our lighting products gain acceptance worldwide.

### **The pandemic is over, and the lighting industry is back on the growth path. What kind of growth are you looking at, and where do you see the lighting industry in terms of CAGR in the next 5 years?**

With the pandemic loosening its grip, the post-pandemic period brings renewed optimism to the Indian lighting industry. The estimated CAGR for the overall lighting market is promising, with Jaquar Group setting higher targets for itself. Focusing on key growth drivers like urbanization, demand for

## CHAT TIME

high-quality, energy-efficient solutions, and technology advancements, Jaquar aims to contribute to the industry's exciting growth.

**Do you see a change in consumer behaviour over time, and how does your marketing and R&D team develop the right product portfolio to embrace this change?**

Consumer behaviour is ever-evolving, yet the basic motivations remain constant. Jaquar's role is to create products using the latest technology and facilities, offering the best to customers. Our marketing and R&D teams work in tandem to align the product portfolio with changing consumer needs, ensuring that Jaquar remains at the forefront of innovation.

**What is your message to the association regarding the overall situation and challenges in market conditions that can be shared with other members/stakeholders?**

Creating awareness that international-quality products can be made in India is crucial. Jaquar aims to lead by example, producing products comparable to the best globally. By collaborating with renowned designers, winning awards, and taking the brand global, Jaquar believes in elevating the entire industry and India's image worldwide.

**The industry is shifting towards more sustainable products. How does Jaquar contribute to reducing the**

**overall carbon footprint in the lighting industry?**

Switching to LEDs reduces waste in landfills and emits less CO2. Jaquar's LED lighting products are eco-friendly, energy-efficient, and designed to withstand diverse Indian conditions. Rigorous testing ensures endurance, reliability, and durability. Jaquar strives to be a responsible contributor to reducing the carbon footprint in the lighting industry.

### IN A LIGHTER VEIN

**How do you unwind after a hectic day or weekend at work?**

I love spending time with my son and family members. And my hobby is collecting miniature model cars and spend a lot of time with them also.

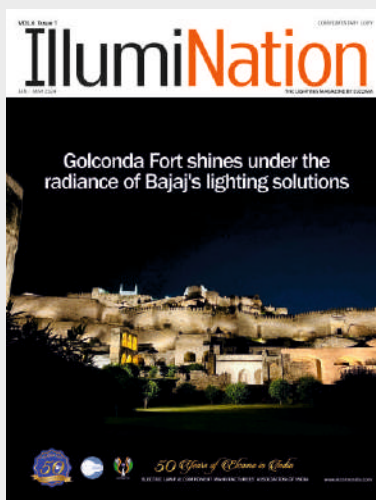
**What are your top 2 holiday destinations?**

London and Dubai

**What kind of food/cuisine do you like?**

Indian and Chinese food

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# OSRAM



# Bajaj illuminates Golconda Fort's Historic Grandeur

The Architectural Marvel of Golconda Fort transforms into a luminous tapestry of vibrant history with professional lighting solutions from Bajaj Electricals





**T**he Golconda Fort in Hyderabad is an architectural marvel, with each monument and structure showcasing the rich heritage of the region. Several dynasties, such as the Kakatiyas, Bahmanis, Qutb Shahis and Mughals, have left precious architectural



imprints on the fortress. Bajaj Professional Lighting has designed the illumination for this prestigious monument, following crucial aspects of architectural lighting, such as fort preservation and harmonizing the need for enhanced aesthetics, visibility, and security while maintaining historical significance.

Using Phant RGB Flood Lights, Bajaj has brought alive the tales of some prominent monuments within the fort, such as the Fateh Darwaza, Durbar Hall, Rahban Cannon, Hawa Mahal, among others. The lighting solution further enhances the beauty of the charming public gardens inside the fort.

Architectural lighting for forts should not only serve functional purposes but also contribute to the fort's overall identity, historical significance, and the experience of visitors.

The Bajaj Professional Lighting team met several challenges and executed the project keeping in mind various architectural lighting principles while illuminating forts and other such

historical monuments.

**Security and Safety:** the team prioritized the safety and security of the fort by ensuring that critical areas, such as entrances, perimeters, and pathways, were well-lit to deter intruders and enhance visibility for security personnel.

**Historical and Aesthetic Considerations:** the Bajaj Professional Lighting designed the illumination project keeping in mind the the historical significance and architectural style of the fort. They used lighting fixtures that complemented the fort's design while highlighting key features, such as walls, towers, and entrances.

**Minimize Light Pollution:** Bajaj Professional Lighting team chose lighting fixtures that minimized light pollution to maintain the fort's ambiance and avoided disrupting the surrounding environment. Directed and shielded fixtures helped focus light where it was needed without unnecessary spillage.

**Accentuating Architectural Details:** the team used lighting to highlight specific architectural elements, such as



battlements, arches, or sculptures which not only enhanced the fort's visual appeal but also created a dramatic effect during nighttime.

**Dynamic Lighting:** the Bajaj Professional Lighting team implemented a dynamic lighting system that can change color or intensity which allows for different lighting scenarios to be created and displayed with ease on special events, historical commemorations, or seasonal variations.

**Energy Efficiency:** the team opted for energy-efficient LED lighting fixtures to reduce environmental impact and operational costs. Additionally, they incorporated sensors and controls to

adjust lighting levels based on the time of day or presence of people.

**Collaboration with Historical Experts:** the project team worked closely with historical preservation experts and architects to ensure that the lighting design aligns with the fort's historical context and any preservation guidelines in place.

**Balancing Lighting Levels:** the project team achieving a balance between accent lighting and overall ambient lighting ensuring that key features are highlighted without creating overly bright or dark areas.

**Maintenance Considerations:** Bajaj

choose durable lighting fixtures that can withstand the harsh environmental conditions often found around forts and planned a regular maintenance schedule to address any issues promptly and keep the lighting system in optimal condition.

A visit to Golconda Fort transforms visitors into a luminous tapestry, painting a vibrant picture as history unfolds for generations to come. Shining under the radiance of Bajaj's lighting solutions, Golconda Fort stands as a beacon, throwing light on the past and brightening the path of the future.

**AUTHOR : BAJAJ ELECTRICALS LTD**

*Views expressed in this article are those of the contributors and do not necessarily reflect those of the editors or publishers*



# Enforcement Activities by BIS to Curb Sale of Non-Compliant Electronic Products

Ministry of Electronics & Information Technology (MeitY) (erstwhile DeitY) notified Electronics and Information Technology Goods (Requirement for Compulsory Registration) Order, 2012 on 03 October 2012, initially for fifteen categories of electronics items. More

categories were subsequently added. A wide range of electronic items, many of which are daily use products, are covered. This list covers mobile phones, scanners, amplifiers, set top boxes, laptops, printers, luminaries, LED flood lights, lighting chains, televisions, music systems, digital cameras and so on. The

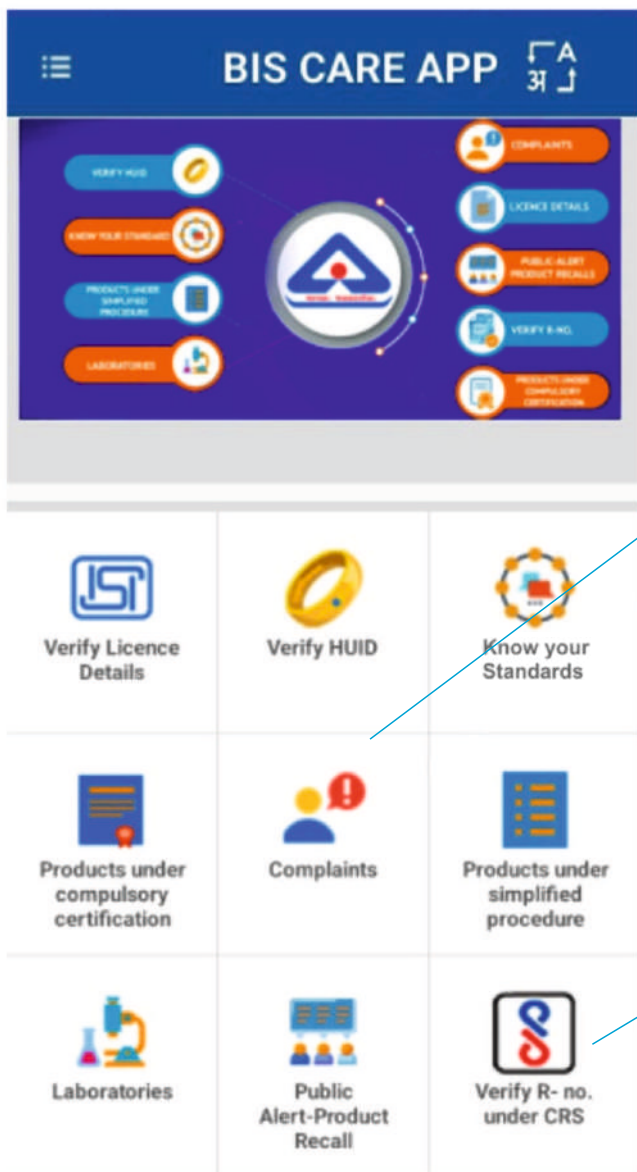
complete list is available in public domain and can be accessed through <https://www.crsbis.in/BIS/products-bis.do>

BIS has been receiving a large number of complaints related to above referred compulsory registration scheme (CRS). Complaints pertain to following two types: Misuse of registration mark, i.e., applying the mark without authorisation; and violation of compulsory registration order, i.e., production /sale / display for sale / distribution of these products without BIS Registration Mark. While 15 complaints are still under investigation, BIS Branch Offices have carried out 37 Search and Seizure operations across the country during the last two years. Subsequent to successful Search & Seizure operation, legal action for violation of BIS Act, 2016 is also being initiated against the offenders.

Consumers can also verify details of registered manufacturers and report violations of BIS Act using BIS CARE App.

Alternatively, complaints can also be lodged through a web portal <https://www.bis.gov.in/index.php/consumer-overview/consumer-overviews/online-complaint-registration/> or by writing an email to BIS at [complaints@bis.gov.in](mailto:complaints@bis.gov.in)

In case of any queries, you can contact Head (Complaints Management and Enforcement Department) Bureau of Indian Standards, Room No. 101, Manakalaya, 9, Bahadur Shah Zafar Marg, New Delhi – 110002, Tel: +91-11-23235069.



Report violations of BIS Act, 2016 using 'Complaints' feature of the App

Verify details of registered manufacturers using R No. mentioned on the product

# Wipro Illuminates India's Longest Expressway

Wipro Consumer Care and Lighting enlightens Stage 1 of India's longest Expressway, Hindu Hrudaysamrat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg.

**W**ipro Consumer Care and Lighting (C&I) Business recently completed the lighting project for Maharashtra's milestone foundation, Hindu Hrudaysamrat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg. The improved street lighting is another facet of the safety measures that have been undertaken to construct this expressway. The expressway was officially opened

on December 11, 2022, by honourable Prime Minister Narendra Modi.

This expressway connects two major cities in India, Mumbai and Nagpur which is going to foster socioeconomic prosperity throughout the state of Maharashtra. Wipro Lighting won the illuminating contract in 2021 and considered the project as a unique opportunity to help the country grow.

The project application and installation involved Wipro's Outdoor Lighting segment of products like Arcus, Streetlights, Step lights, Floodlights and Urbano pathway luminaires. The Arcus range of products, Wipro's Façade lighting solutions, enhanced architectural focal points, improved safety and security. The Urbano pathway, part of Wipro's landscape lighting range, enhanced the beauty with





uniform light distribution. The expressway is illuminated by these fixtures, which also represent Wipro's dedication to excellence.

"As we witness the inauguration of the Samruddhi Mahamarg, we are not simply illuminating a street but also the way to Maharashtra's future. This project demonstrates a huge achievement for both the Maharashtra state and Wipro, displaying our devotion to quality and development. Wipro Lighting thanks the Government of Maharashtra for

entrusting us with this important project. We look forward to our cooperation to continue the advancement and progress of Maharashtra. Samruddhi Mahamarg is more than just a highway; it is a testament to Wipro's commitment to excellence and quality service and the great future we all have in store for Maharashtra." said Mr Anuj Dhir, Business Head & Sr. Vice President at Wipro C&I Business.

Illuminating India's longest expressway isn't a simple undertaking. Specialists

from various teams of the Wipro group dedicated their vigorous efforts, both from a distance and onsite, overcoming various difficulties with relentless responsibility. They persevered and made sure that the critical portion of 701-kilometer-long expressway was illuminated in a seamless manner. This has allowed a lot of people to see the splendour of Wipro's superior quality lighting fixtures.

**AUTHOR : WIPRO LIMITED**

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# Signify Illuminates Telangana Secretariat

A Harmonious Fusion of Culture, Innovation and Sustainability

The architectural landscape of Hyderabad, the capital of Telangana, is graced by the magnificence of the newly constructed New Telangana Secretariat. This contemporary edifice is a fusion of modernity and state-of-the-art features, architectural grandeur, and historical aesthetics, built to embody the cultural richness of the region. At its heart lies a design that pays homage to the Indo-Saracenic style, combining Indo-Islamic architectural features. The multiple domes and arches of the building perfectly fit in this style representing the syncretic and liberal Deccani style, expressing Telangana's quintessence.

Beyond its architectural brilliance, the secretariat sought to extend its allure into the night, to stand as a shimmering testament to the rich cultural heritage of the region. This aspiration found its realization through the art of facade

lighting, a craft that transcends mere illumination to create a lasting, indelible impression.

Entrusted with the task of illuminating the Telangana Secretariat's new building, Signify embarked on a mission to blend innovation with tradition. The approach was to seamlessly integrate the state-of-art LED lighting fixtures from the 'Philips Uni range' into the secretariat building's architecture. These fixtures, meticulously engineered, were strategically positioned to accentuate the building's contours, resulting in a breathtaking visual spectacle. A mixture of RGBW DMX Control fixtures were used to create the iconic illumination of the crescent facade. Beyond static illumination, RGBW DMX-controlled fixtures transform the facade into a dynamic platform. These fixtures offer versatility, enabling the Telangana Secretariat to adopt dynamic themes as

per various occasions. The programmable nature of these lighting fixtures enable the new secretariat building to transform into a celebratory beacon during special occasions, casting a radiant glow that captivate the spectators. The Telangana Secretariat's facade lighting is a testament to the power of design to transcend functionality and connect us emotionally to our surroundings.

Strategic placement of lights was pivotal in achieving the desired lighting effects. Techniques such as 'uplighting' from below the building created depth, while 'grazing light' across surfaces accentuated textures and added dimensions, revealing the architectural nuances. The precision optics based lighting fixtures used in the project was not only an artistic choice but also a consideration to mitigate light pollution, ensuring that the brilliance of the



illumination did not compromise the natural environment.

The site location posed its own challenges and opportunities. Situated adjacent to the picturesque Hussain Sagar Lake, the lighting solution had to withstand environmental tests while maintaining its allure. Signify's commitment to high-quality lighting solutions guaranteed durability and minimal maintenance.

Signify's vision extended beyond sheer aesthetics. Sustainability was also a critical consideration in facade lighting design. By incorporating energy-efficient LED lighting and intelligent control systems, the lighting design minimized energy consumption while minimizing the environmental impact. The lighting scheme was not just about magnifying the building's beauty; it was a conscious effort to balance functionality, aesthetics, and sustainability.

The significance of such illumination goes beyond mere ornamentation. It transforms structures into an integral

part of citizens' lives, instilling a sense of connection and pride. Dynamic lighting not only defines the city's skyline but also shapes how inhabitants and tourists perceive and engage with their surroundings. It fosters an emotional connection, imprinting a unique identity onto the cityscape.

Signify being a leader in illuminating iconic landmarks not only brings pride to the nation but also encapsulates innovation, sustainability, and artistic expression. Our endeavors reflect a commitment to not just illuminate

buildings but to evoke a sense of awe and belonging, symbolizing a celebration of cultural heritage and innovation.

*Credits*

*Project - Dr. B.R. Ambedkar Telangana Secretariat*

*Customer - Government of Telangana*

*Govt. Department - Roads & buildings Department*

*Contractor - Shapoorji & Pallonji*

*Architects - Oscar & Pomni Architects*

*Electrical Consultant - Synergy Infra Consultants Pvt.*

*Ltd.*

**AUTHOR : SIGNIFY INNOVATIONS  
INDIA LIMITED**

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# Jaquar Illuminates Trivandrum's Heritage Buildings

Jaquar lighting illuminates the rich cultural heritage of Gods own country, Kerala with its latest and cutting edge technological products

The Travancore Heritage Project is an initiative by the Kerala Tourism Department that intends to promote the rich cultural heritage and beauty of Kerala even during the night. The aim of the project is to provide a captivating experience of illuminated heritage buildings and a touch of grandeur by adding multi-faceted tones of lighting and illumination. This proactive step by Department of Tourism resulted in mesmerizing lighting installation that transform dark spaces into extraordinary lighting experiences.

Nested in the southernmost district of Kerala, Thiruvananthapuram is a city that harmoniously blends tradition and modernity. As the capital city of Kerala,

it boasts a rich cultural heritage and is renowned for its architectural marvels. The district is also home to internationally acclaimed beaches and a thriving tourism industry.

Jaquar partnered with the Kerala Tourism Department for the project that is powered by Jaquar lighting and controls technology to create a lighting display that showcases some of Trivandrum's most iconic landmarks and religious places.

Visitors that visit Trivandrum City can now immerse themselves in the captivating night life of the heritage city and take an enchanting stroll through illuminated streets, where heritage buildings come alive with subtle colors

and patterns that celebrate their architectural splendor.

Jaquar illuminated several buildings in the city that included magnificent sites like Palayam Juma Masjid, St. Joseph's Church, Shree Sakthi Vinayaka Temple, Connemera Market Gate, AG's Office, Kerala Museum, Napier Museum, Kanakakunnu Palace and the KTDC Mascot Hotel

The project presented several challenges while execution, but the highly experience team of project management officials brought out a change to the installation procedures in order to successfully execute the project.

Being a heritage site, it was unacceptable drill holes to install the





clamps for the luminaires. The Jaquar Lighting team worked extensively on these issues and in conjunction with adhesive experts, came up with a solution that consisted of a special kind of adhesive that has the load bearing

capacity higher than that of the luminaire and that would not cause damage to the building as well as last for a long number of years.

Napier museum which is one of the oldest building in Trivandrum, was built in 1857. The lighting effect showcases its textures with several layers of light each installed and specified in a way that it does not mix at any point of the surface.

Nearly four and a half thousand luminaires that were manufactured and customized by Jaquar Lighting made the project experience possible. With an understanding that proper arrangement is key to creating an immersive lighting experience, Jaquar's experts paid meticulous attention to every detail during the installation process. Within the project network, various different types of Jaquar LED fixtures were

installed, from LED flex to customized linear wall grazers to washers Jaquar also designed tailor-made housing and parameters for corrugated spaces and decorative structures, ensuring a seamless blend of functionality and aesthetics. One of the standout features of the project is the use of customized beam angles such as asymmetric ones and even using some amount of diffusion over the lenses to achieve the effect envisaged by the department of Tourism.

Apart from completing the project and meeting the expectations of stake holders, the ultimate goal of the Jaquar Lighting team was to create a truly majestic and awe-inspiring lighting experience.

**AUTHOR : JAQUAR & COMPANY  
PVT.LTD**

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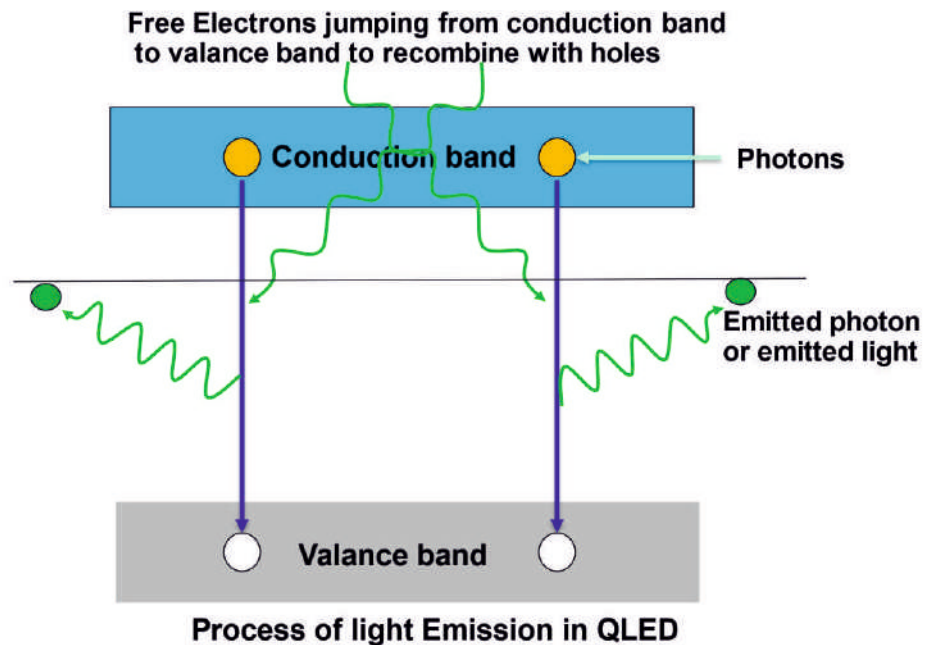


# Quantum Dot LEDs and their Applications

Due to increasing demands of lighting, both in the developed and developing world, the resource requirement for meeting such demands also increases simultaneously. Not only are resources required for the chemical and physical processes, but such requirements result in increasing the carbon footprint also. Therefore, the demand for light sources of high luminous efficacy per watt of electricity consumed is exponentially increasing but also increasing is the colour rendering indices of such sources close to that of tungsten lamps and also for achieving carbon neutrality. Quantum dot LEDs (QLED) are expected to meet such demands in displays, in particular, and to a wide spectrum of applications from single-photon sources to lasers to solar cells etc., in general.

Quantum-dot LEDs (QLEDs), first introduced in 1994, are an emerging class of solution-processed electroluminescent (EL) devices using colloidal quantum dots (QDs) as emissive materials. High efficiency, tunable wavelength, narrow-band emission and compatibility with large-area or flexible substrates are the enhanced features of QLED, making them a competitive candidate for next-generation display technology.

In recent times, QLEDs have attracted much attention because compared with traditional LED display, QLED display has advantages in flexible and robust applications. QLED display is a self-emissive display, in which light is generated by individual subpixel, each subpixel can be individually controlled



which makes wearable and stretchable display possible in the future.

Quantum dots (QDs) are semiconductor nanocrystals having particles of a few nanometres in size with optical and electronic properties that differ from those of larger particles as a result of quantum mechanical effects. When the quantum dots are illuminated by UV light, an electron in the quantum dot can be excited to a state of higher energy. In the case of a semiconducting quantum dot, this process corresponds to the transition of an electron from the valence band to the conduction band. The excited electron can drop back into the valence band releasing its energy as light. This light emission (photoluminescence) is illustrated in the figure 1. The color of that light depends

on the energy difference between the conduction band and the valence band, or the transition between discrete energy states when the band structure is no longer well-defined conduction band.

Quantum dots (QDs) have properties intermediate between bulk semiconductors and discrete atoms or molecules. Their optoelectronic properties change as a function of both size and shape. Larger QDs of 5–6 nm diameter emit longer wavelengths, with colors such as orange, or red. Smaller QDs (2–3 nm) emit shorter wavelengths, yielding colors like blue and green. However, the specific colors vary depending on the exact composition of the QD,

To date, the device performances of QD-

LEDs such as their external quantum efficiency (EQE), brightness, and lifetime have improved rapidly by developing new QD materials, optimising device architectures and innovating fabrication processes. There have been tremendous efforts to achieve high external quantum efficiency (EQEs), high colour purity and long lifetimes in QD-LED devices. The development of EL-based QD-LED devices having high electro-optical performances and long lifetimes is the state of art research at present. The photoluminescence quantum yield (PLQY) also called the EQE of the QD-LED device is the function of the properties of QD materials, while high colour purity of QD-LEDs depends on the uniformity of the core size of QDs. Besides, the material stability is directly related to the lifetime of QD-LEDs.

Quantum dots (QDs) are promising material for producing full-color display devices. Due to efficient patterning technology of red, green and blue pixels with QDs on the active-matrix, full-colour displays based on QD-LEDs with excellent device performances are possible in mass production.

Potential applications of quantum dots include single-electron transistors, solar cells, LEDs, lasers, single-photon sources, second-harmonic generation, quantum computing, cell biology research, microscopy, and medical imaging. Their small size allows for some QDs to be suspended in solution, which may lead to their use in inkjet printing, and spin coating. These processing techniques result in less expensive and less time-consuming methods of semiconductor fabrication. Quantum dot light-emitting diodes (QD-

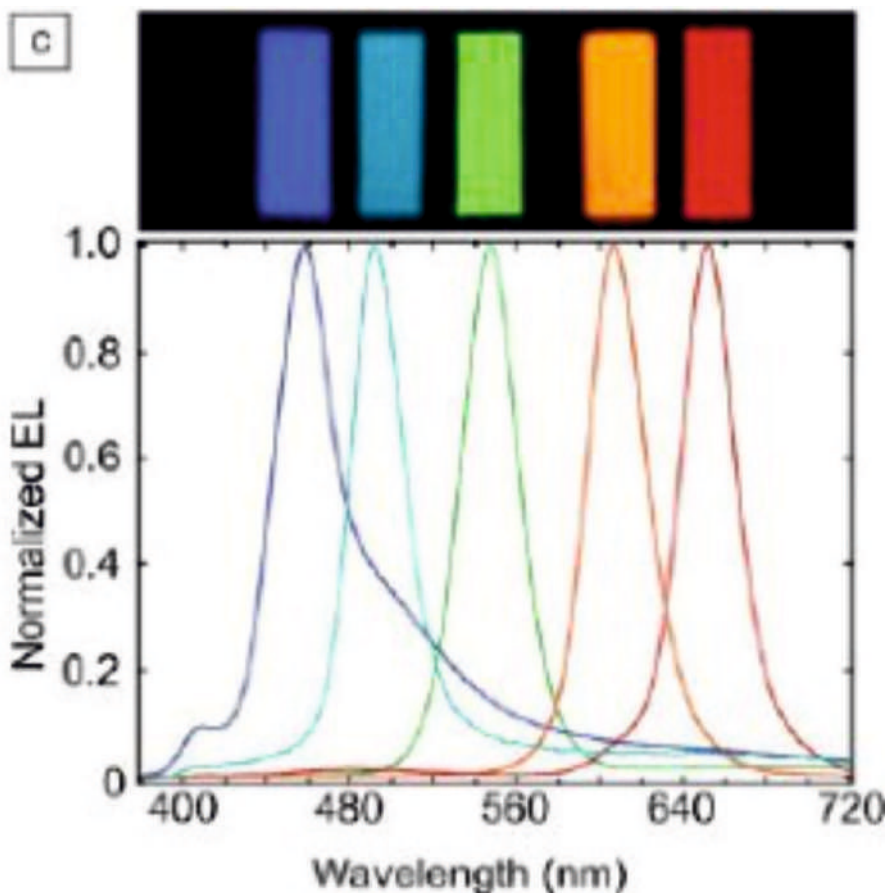
LEDs) are one of the most promising self-emissive displays in terms of light-emitting efficiency, wavelength tunability, and cost.

Color accuracy, peak brightness, improved contrast ratio, and physical design are the notable advantages of QLED displays. In addition to these advantages, the fine-tuning of fundamental quantum dots for precise colors, coupled with their high peak brightness from LED backlighting provide them an edge over OLED panel. Future applications using QD-LEDs can cover a range from a wide color gamut and large panel displays to augmented/virtual reality displays, wearable/flexible displays, automotive displays, and transparent displays, which demand extreme performance in terms of contrast ratio, viewing angle, response time, and power consumption. Although the efficiency and lifetime have been improved by tailoring the QD structures, yet there are various open questions which need be answered, namely, how to prepare large-area uniform QD thin films for QD-LEDs without compromising their efficiency and stability. Currently, longevity and inkjet-printing fabrication of QD-LEDs are being tested for future commercialization. In addition, heavy-metal-free QD-LEDs are being explored in a big way for future generation applications.

**AUTHOR : DR. J.K. JAIN, CHAIRMAN AND MANAGING DIRECTOR, FIEM INDUSTRIES LTD AND DR. H.C. KANDPAL, V.P. R &D, FIEM INDUSTRIES LTD.**

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*The authors have consulted of the research papers, journals and review articles for writing on this topic. Due to paucity of room for accommodating those, the authors are constrained to mention all those references. However, they heartedly thank and acknowledge all those authors for guiding the way towards this article.*



# Do accuracy and tolerance have any meaning in lighting?

One of the characteristics of lighting design that has amazed me for years is that many designers, including those from an engineering background, never seem to consider the uncertainties involved in the design process. I have also seen strident arguments about whether 490 lux meets a Standard's requirement that the (maintained) illuminance be 500 lux. Does anyone ask what a lumen output of, say, 3,000 lumens means? Is it the initial value, the average through-life value or end of life value? Is the light output sensitive to supply voltage fluctuations. Is the life of the source affected by the number of switching cycles it experiences? And what about the effects of environmental and luminaire temperatures on lumen output and life? And the list of questions can go on and on.

Most lighting Standards now use Maintained Illuminance as the illuminance criterion, i.e., the value below which maintenance is needed for compliance, which is a meaningful criterion compared with the previous Service Illuminance which was a though-life average of actual (measured?) illuminance; basically it was impossible to determine if the lighting system complied due to the implicit requirement to keep records of point (or average) illuminances and the rolling average over time. An actual illuminance of 400 lux, did not necessarily mean non-compliance with a Service Illuminance of 500 lux, unless the average over time dropped below 500 lux. It was a crazy system that was almost totally useless.

Most interior lighting involves the achievement of illuminances resulting from flux directly from luminaires and flux that arrives indirectly, from inter-

reflected flux from the room surfaces. Often, the lighting designer needs to make assumptions regarding the interior surface finishes before the architect has made selections; this is a source of uncertainty, along with many others, for example, from replacing the design luminaire with (a cheaper) one during the tender process.

And what about daylight's contribution to the required illuminances? Is daylight considered since the objective is lighting design and daylight is light?

I think that you can see how fraught the process can become, yet no-one seems to be concerned that the design process can be very imprecise.

## Mensuration

The various processes involved in measuring physical quantities is called mensuration and the study of measurement is metrology: a specialised area of physics.

Of major importance in mensuration is the accuracy of the measurements. It is here that there is much confusion both of meaning and what a measuring instrument is indicating. If something is measured accurately there should be a low uncertainty that the measurement is not the same as that which would be achieved using the standard. This involves not only the quality of the measuring instrument but how the measurements are performed. There are

many sources of potential error and these can be estimated and give rise to an estimate of the uncertainty of the quantity being measured. Two important concepts are discussed next.

## Accuracy and precision

Many tradespeople are taught "measure twice, cut once". This is because people frequently make mistakes when performing measurements; errors are made.

Firstly, it is important to distinguish between the accuracy of a measurement and its precision. The Figure shows the results from four shooters who undertook target practice. Shooters (a) and (c) got all their shots within a very small area; they shot with great precision. Shooters (b) and (d) had shots spread over a large area, indicating poor precision.

Precision is the closeness of agreement between repeated test results (or shots, in the case of the shooters). The average of all the highly precise shots will be close to each of the individual shots and if this average is from a large number, it will indicate the "true" value, however, in the case of (c) the average will not be close to the bullseye.

Shooter (c), whilst showing high precision, missed the target because of low accuracy of shooting.

Accuracy is the closeness of agreement between the test result (the average of all

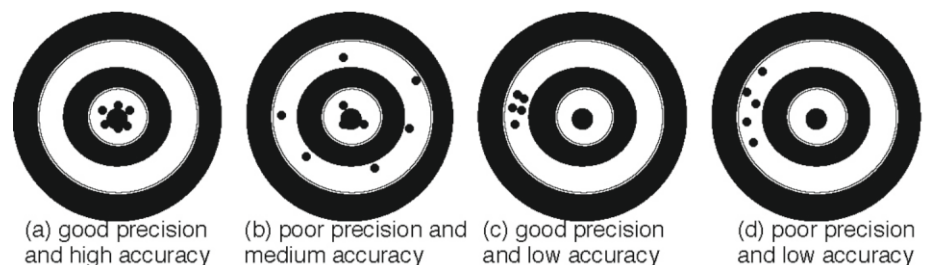


Figure. The concepts of precision and accuracy are illustrated in the results of this target practice.



the shots) and the “true” value (in this case, the bullseye). In this case the “true” value is obvious but, in many cases, the “true” value is being sought, rather than being known, so it is important that there is high accuracy as well as precision, otherwise the “true” value could be taken as (c) rather than (a).

### Random and systematic errors

The fact that all the shots are spread out over the target indicates that errors have been made by the shooters; even those with high precision cannot hit the same spot twice. The best shooter, it seems, will hit the centre of the bullseye only by chance. Shooter (b), by chance will also hit the bullseye, given enough shots. Likewise, shooters (c) and (d) have their shots falling in a particular area on the target but well away from the bullseye; in their case there seems to be an error that puts them always off-target.

The scatter of results around the expected result is due to random errors. These could be due to small variations in the quality of each bullet, affecting its flight, the effect of wind, temperature, etc. Shooters (a) and (c) have low random errors, indicating that they have tried to minimise or compensate for these effects. Random errors cannot be eliminated but they can be minimised, for example, by using good quality equipment and using standard test conditions (for example, for temperature, humidity and air movement). However, as has been already noted, there will always be some random error present, making perfection impossible. Shooters (b) and (d) have not minimised their random errors.

Shooters (c) and (d) consistently missed the bullseye and that their expected results are always to the left of the bullseye, ie, their expected result is not near the true value (the bullseye). These shooters are making a systematic error which is the departure of the expected value from the true value. In their case, the main systematic error seems to be with the gunsight, causing their aim

always to be to the left of the bullseye. Correcting the sight should result in the expected value to be close to the true value as in cases (a) and (b).

In a laboratory, the true value often is not known but is being sought. For example, a lamp may be being calibrated to produce a known intensity for the calibration of illuminance meters. This involves, amongst other factors, being able to measure the lamp voltage accurately and precisely. If there is a systematic error in the calibration of the voltmeter so that it always indicates the “true” voltage +0.5 volts, then the calibration of the lamp will be wrong, as will those of all the illuminance meters calibrated against the lamp. If the voltmeter is a high-quality instrument, wrongly calibrated, it may be difficult to discover the systematic error. The effects of that one systematic error can be great since all the illuminance meters calibrated against the intensity standard lamp will be in error, no matter how “good” the illuminance meters are. They will all have an inbuilt systematic error. They will all perform like shooters (c) and (d) — off target or off the “true” value, irrespective of precision. Note that repeated measures will not detect the systematic error unless the “true” value is already known or estimated. Repeated measures will allow the estimation of random errors.

A common systematic error in using handheld illuminance meters is to allow body shadow to fall in the photocell, reducing the amount of light reaching the meter. This can be hard to eliminate due to the need to read the meter and the fact that the photocell and the display are adjacent.

Systematic errors should (be able to) be eliminated from measurement, leaving only the random errors and the residual or basic uncertainties of the measuring instruments. “Human error” does not exist as such, it is usually systematic errors due to lack of skill, lack of care, etc.

### Uncertainty

From the above, all measurement (and design) involves uncertainty as to the measurement (and the outcome of design).

A report on each of the shooters could give the average position of the hits (by taking the mean of all the hits) together with an estimate that accounts for both the spread of shots (the level of precision or random error) and the average position's departure from the bullseye (the level of systematic error).

This estimate is analogous to uncertainty. The uncertainty estimate is always associated with a confidence level. If shooter (a)'s uncertainty estimate is 30mm with a confidence level of 99%, this means that 99% of the person's shots will hit within 30mm of the centre of the bullseye.

It is beyond the scope of this paper to show how uncertainties are determined but they are usually expressed as a percentage of the quantity. For example, a very good quality, recently calibrated illuminance meter might have an uncertainty of 5%. This means that any measurement taken with that meter will indicate the “true” value plus or minus 5%, written as  $\pm 5\%$ . So, if the target value of a lighting design is 500 lux and the average measured value is 480lux, it cannot be said that the design has failed to reach the target, since any reading between 475 and 525 lux could be “true”. Readings in this range are said to be indeterminate but are usually interpreted as “passing”. If the average reading was less than 475 lux, the design has “failed”. To be “certain” that the design has passed, the average would need to exceed 525lux. (Actually, a little more, since the “pass” criterion is given by  $s/(1-u)$ , where  $s$  is the specified or target value and  $u$  is the residual total uncertainty, expressed as a decimal fraction, ie,  $s = 500/(1-0.05) = 500/0.95 = 526.3$  lux.

Most lighting standards give no indication of acceptable design (target) tolerances or closeness accepted as passable, so an illuminance of 500 lux

means not less than 500 lux. This is silly since every part of the design process has associated with it (large) uncertainties. The only way to be “safe” is to “overdesign” for the uncertainties.

Each part of a process involves uncertainties that may act together or against each other. Therefore, the residual total uncertainty is not the sum of the individual uncertainties, rather the geometric sum is used. For example, if each of the four steps in a process involves an uncertainty of 4%, the residual total uncertainty is given by  $(42 + 42 + 42 + 42)0.5 = \sqrt{64} = \pm 8\%$  not  $4 \times 4\% = 16\%$ .

**Measuring instruments**

Measuring instruments are calibrated against Standards. Each step removed from the international standard involves uncertainty and the procedures used in each laboratory involve other uncertainties that combine in various ways to result in the estimated uncertainty of the measurement. Minimising the uncertainty is the objective of those who build measuring instruments and those who run laboratories. It is implicit, from the above, that the “accurate” measurement of a quantity requires considerable knowledge of the quantity, the required measurement conditions, the limitations of equipment, environment, etc, and skill in the operation and maintenance of the laboratory to minimise errors.

Sometimes a meter may have amongst its specifications the term repeatability which should not be mistaken for accuracy of measured quantity. Repeatability means that it will produce the same measurement of the quantity to within a certain tolerance each time it is measured. It does not indicate the accuracy of the measurement. Sometimes the stability of the instrument is stated — this indicates that it will indicate the quantity without, say, drifting over time: it says nothing about accuracy.

Instruments with digital displays should not necessarily be seen as “more

accurate” than those with analogue displays (dials or meters). The display device is needed to present the quantity in some way so that it can be read. The display device has accuracy limitations and it is usual that it is less uncertain the greater the use of the scale involved, that is, the greater is the use made of full-scale deflection (to use the term associated with a pointer moving over a graduated scale, as on an analogue meter). The designer of the instrument should estimate the uncertainty of the overall instrument and provide a display that indicates that quantity without any further increase in uncertainty. The provision of more “decimal places” on a digital display is no indication of increased accuracy, since the last few may be nonsense.

In general, portable light-measuring equipment for use by engineers/designers to check, say, illuminances have relatively high uncertainties, compared with some other measuring devices. The instrument may incorporate highly stable electronics and use good quality detectors, but the main limitation is usually the uncertainty with which the V( ) filter can be matched to the spectral sensitivity of the particular detector being used. The instrument may be highly stable, have excellent repeatability but a high uncertainty (or error). What meaning should then be placed on a measured (indicated) illuminance of 1523.7 lux if the uncertainty of the instrument is  $\pm 10\%$ ?

**Uncertainties in design**

Some of the objectives in lighting design involve the achievement of certain light technical parameters, e.g., an illuminance. Strangely, most designers do not consider uncertainties in their design work and accept input data to their designs as “accurate”. Similarly, the client may take measurements of the built-solution and argue about whether the targets have been met without any consideration of measurement uncertainties. This last point has already been discussed.

An estimation of the best total

uncertainty in the design of illuminance using a direct/indirect low brightness lighting system in interior lighting is  $\pm 32\%$ ! This suggests that the design illuminance, at end of the maintenance period, to be “passable” should be  $500/(1 - 0.32) = 735$  lux for tasks which require 500 lux. The initial illuminance would need to be higher still, to take account of losses over the maintenance cycle. For example, if the maintenance factor is 0.7, the initial design illuminance would be  $735/0.7 = 1050$  lux. This determines the capital cost of the lighting system. This illuminance is 50% more than the target or design value. Most designers ignore the uncertainties of  $\pm 32\%$  but usually take account of the depreciation over the maintenance cycle.

Therefore, the technical aspects of lighting design are unrealistic and it is not surprising that disputes arise regarding the achievement of targets or “getting what you paid for”.

**Finally**

I hope that this discussion has been of interest and that designers will be more cautious in making claims regarding their lighting designs, especially if they have no way of confirming the photometric performances of light sources and luminaires, room surface finishes, electrical supply characteristics, risks of product substitution and more!



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Views expressed in this article are those of the contributors and do not necessarily reflect those of the editors or publishers

*Reference/s : AS/NZS3827:1998 Accuracy and Tolerances in Lighting Design and Measurement*

# Urban Lighting Digital Management Software R&D and Application

Sustainable development in urban construction and lighting is becoming increasingly important in countries around the world. To improve energy efficiency and promote the development of the smart city industry, countries around the world are beginning to formulate relevant policies and regulations, provide appropriate financial support, and encourage the application of innovative technologies and digital solutions. For example, in 2022 the City of London's smart street lighting project in the UK, about 15,000 luminaires for street lighting and landscape lighting in the City of London's financial district were replaced with LEDs and centrally controlled by a central management system (which uses algorithms to automate switching and brightness).

China is also promoting the digital innovation of the economy and building a collaborative and efficient digital performance of the government's work capacity. Pilot applications of urban information modelling platforms are

gradually being implemented across the country and initial results have been achieved. China's Ministry of Housing and Urban-Rural Construction and the National Development and Reform Commission issued a document in 2022 stating that by 2030, the use of LED and other energy-efficient lighting will exceed 80%, and more than 30% of cities will have completed the construction of digital lighting systems. In this context, several research agencies and companies are also actively addressing current issues in the lighting industry, developing digital software and exploring application scenarios.

The core research of digital lighting software is to simulate the lighting effect in real scenes. The software attempts to balance the aspiration of the lighting industry that require technological innovation, a wide range of lighting products, product quality varying between different brands which differ significantly from the existing problems of protecting the quality of the implementation of existing lighting

projects. The software adopts virtual simulation technology to create a library of luminaires and a library of materials and has an interactive system that suits the usage habits of industry insiders.

## Application overview : Assisting design

The interactive software system is designed according to the design process and work habits of lighting designers, which can integrate the lighting scheme design and on-site commissioning. The software has the functions of luminaire query and luminaire screening, which is convenient to find the products that meet the design requirements in the library of luminaires. At the same time, it has developed the functions of luminaire position adjustment, luminaire projection angle adjustment, colour temperature adjustment and so on. The software also has a batch copy of equally spaced arrangement, batch deletion and other convenient functions, so that in the process of program design simulation can be synchronised with the deepening of program design (including the arrangement of luminaires and the selection of luminaires).

The software has a brightness calculation function, which can quickly generate a pseudo-colour map of the whole scene with one click, and it is very convenient to view the brightness level. For the operation of the scene of the type of luminaires, the number and power of data display statistics. Once the lighting scheme is complete, you can quickly capture the multi-view (elevation, top view, flat view) lighting effect diagrams, or create roaming

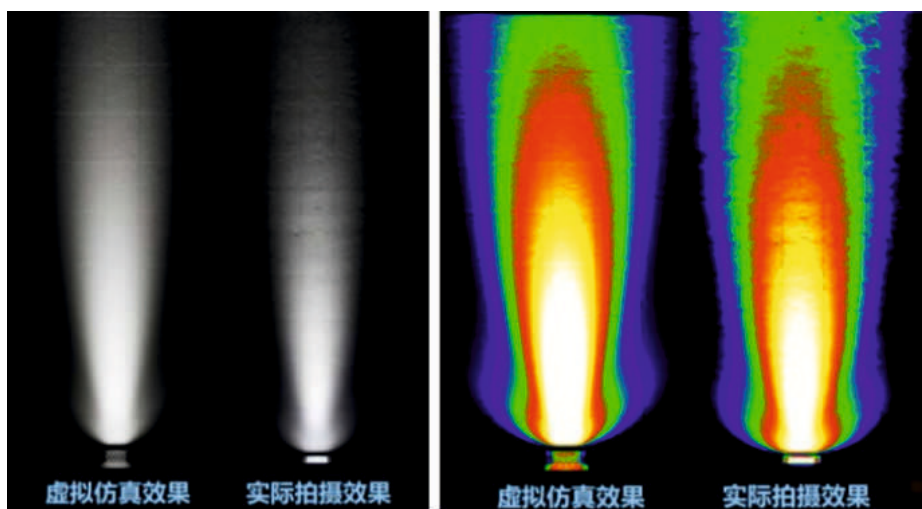


Figure 1. Comparison of simulated lighting effects with real lighting effects



Figure 2. Comparison between simulated and live scenes

animation. The software can also be connected to VR hardware devices for an immersive viewing experience.

**Application overview : Assisting management**

Virtual simulation technology digitally simulates the actual lighting effect and displays the corresponding index data, making it easy for managers to check and calibrate design indices. This

function can provide objective data support for project evaluation and decision-making. Through the three-dimensional immersive browsing function, the interrelationship between group buildings and the overall regional style can be predictively assessed. This feature can avoid the problem of inconsistent lighting styles between neighbouring buildings due to the lack of uniform production standards and

help managers to assess the effect of the completed project more intuitively.

The traditional project data storage mode faces high management costs, difficult to use and other problems, the software has established an online database to solve this problem, the full cycle of project information can be perfect online asset management and information query operation.

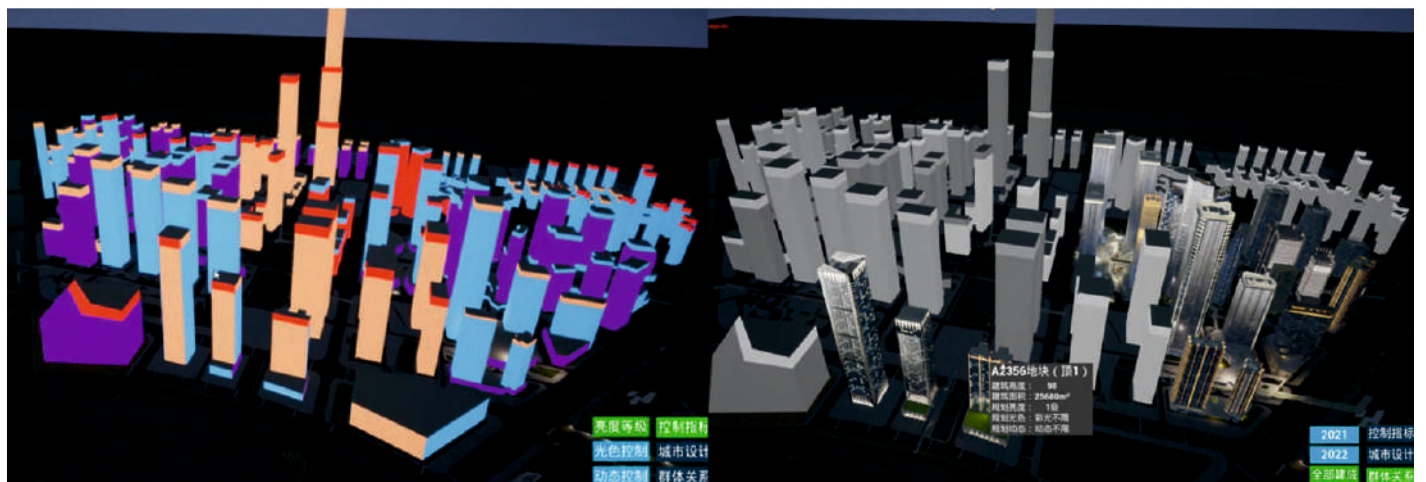


Figure 3. Three-dimensional operation interface

Meanwhile, the integrated control system can accurately lock the fault area in the three-dimensional interface, and intuitively display the operation and maintenance management information. At the same time, the software supports online screen debugging and one-button simulation uploading of preset modes. Through the visual display mode, it can efficiently assist users in operation and maintenance management.

**Planning and outlook**

At present, the road lighting information software offers road scene, pole type, pole parameters, pole layout and mounting functions. The software can simulate pedestrian and driving perspective and immersive driving. It can also instantly generate data to assist

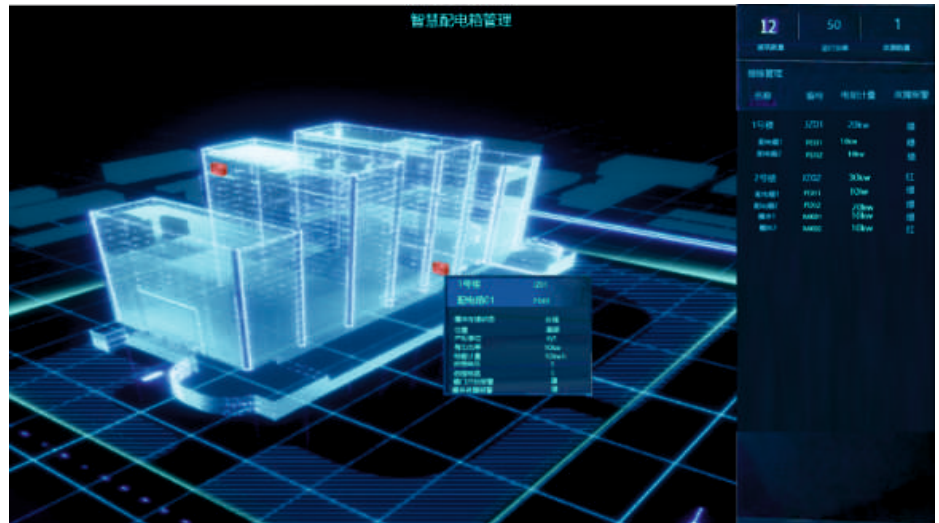


Figure 4. Control System Integration Interface

users in evaluating design options. The design logic of the software is to use actual street lighting application scenarios as the starting point to assist in

product selection, thereby reducing the technical threshold. By setting weights for product screening, it improves product suitability and the user's

decision-making power. In this way, a scientific and efficient market product selection mechanism is established, which ultimately achieves the digital evaluation and management of the entire urban street lighting scene. Through the immersive experience of virtual space and accurate measurement as the basis, the simulation of digital standards within the scene to establish an objective and unified. The ultimate

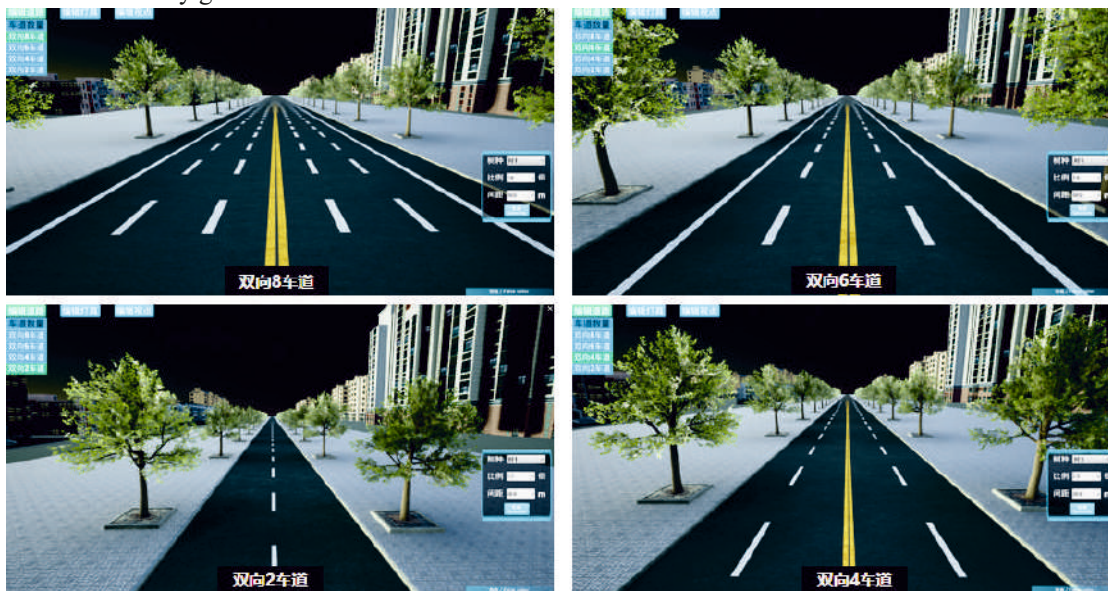


Figure 5. Lane Scene Setting Interface

goal is to provide users with information technology services that integrate software, hardware and management services, and a visualisation platform for the design and management of night scenes.



Figure 6. Comparison of simulation of different road scenarios

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# Production Linked Incentive Scheme (PLI-WG) for LEDs

India is progressing on the ideology of an “Atmanirbhar Bharat” to strengthen the micro and medium enterprises which manufacture indigenous goods. With the advent of technological transformation and globalization across countries trade has set off exchange of goods and services prompting wide variety of choices for the consumers. However, over the years the demand of indigenously manufactured goods decreased due to global competitiveness and cheaper prices. Indian government launched Production Linked Incentive Scheme to incentivize the local manufacturers by providing them financial support and friendly business environment to flourish eventually. The Department for Promotion of Industry and Internal trade (DPIIT) announced this scheme for 14 sectors in April 2021. The scheme is to be implemented over a seven-year period, from FY22 to FY29 and has an outlay of Rs 6,238 crore. The purpose of PLI Scheme is to fortify the global supply chains and put Indian manufacturing Industry as the core exporting nation. The factors like economies of scale, innovative technologies and financial security will boost productivity across industries reducing sectoral disabilities and increment in efficiency. As the nation drives for a resilient manufacturing hub this initiative is a breakthrough for the small industries thriving to survive and expand their production.

The target group for PLI-WG consist of white goods denoting the large home appliances which were traditionally available in white only. The products included in PLIWG are Air conditioners

and LED lights comprising of air conditioner components, high value intermediates (Copper tubes, Aluminum foils and compressors), low value intermediates, LED Lighting Products, LED Chips, LED Drivers, LED Engines, Mechanicals, Packaging, Modules, Wire Wound Inductors , LED Chip Packaging, Resistors, ICs, Fuses etc. To be eligible for the PLI benefits, a company must make Greenfield or brownfield investments. A company must fulfil the threshold of both cumulative incremental investments and incremental sales over the base year.

## LED Lighting

The LED Lights industry in India spans automotive, general, and backlighting for commercial, residential, and industrial use. The LED Lighting Industry is categorized by application (residential, commercial, industrial, and street lighting) and product type (lamps and luminaires). Market players, including Signify N.V., Havells India Limited, SYSKA, Wipro Ltd., and Bajaj Electricals Ltd, are adopting strategies like innovation and partnerships to expand their geographic reach and maintain a competitive edge. The Production-Linked Incentive (PLI) initiative aims to boost local value addition from 25% to 85% by 2028, covering 87% of the LED sector's Bill of Material.

## Government Initiatives

**Ujala (Unnat Jyoti by Affordable LEDs for All) :** The main driver of India's rapid market creation was this scheme, launched in 2015 with a target of replacing 770 million incandescent lamps with LED bulbs and the

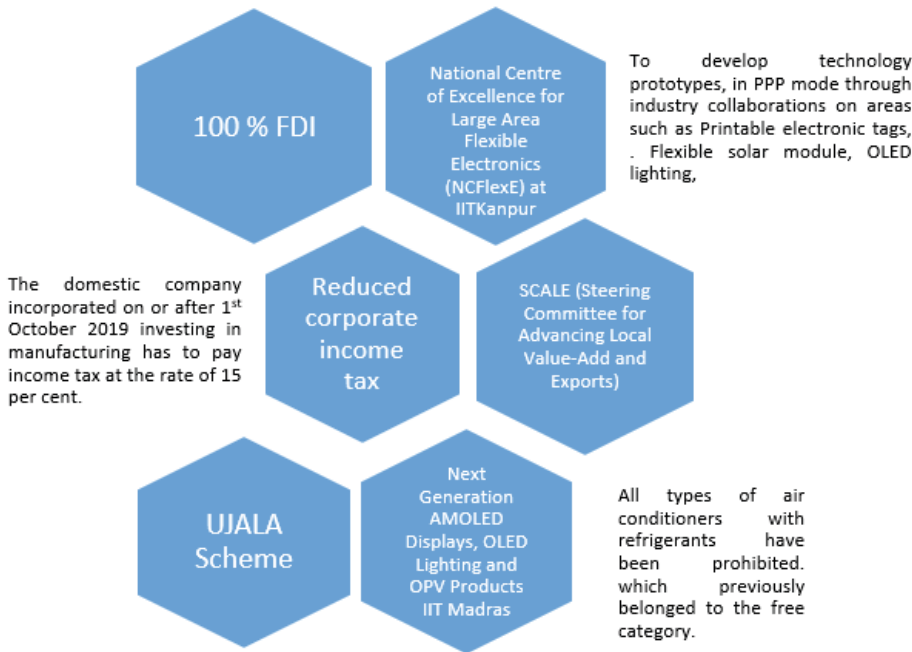
Electricity Distribution Company and Energy Efficiency Services Limited (EESL) was appointed the task of implementing this program. It guarantees the consumers minimum of 2 and a maximum of 10 LED bulbs, depending on the region. Under the scheme, 20W LED tube lights and BEE 5-star rated energy efficient fans are also distributed to the consumers which is 50% and 30% more energy efficient than the conventional tube lights and fans available in market.

## Street Lighting National Program

**(SLNP) :** The Smart LED Street Lights National Programme (SLNP), initiated by the Ministry of Power, aims to replace conventional street lights with energy-efficient LEDs nationwide. EESL has installed over 1.32 crore LED streetlights in urban local bodies (ULB) and gram panchayats. Eventually, it has helped in reducing GHG emissions to 6.15 million tons CO<sub>2</sub> per year and has resulted in energy savings of 8.92 billion kWh per year. By 2024, it is expected to install additional 1.6 crore LED streetlights. This initiative has created jobs, aligning with the Make in India campaign.

## Indian LED Market

LED light is a potent semiconductor source converting electrical energy into light. LED lights are known for their energy efficiency, consuming 75% less power and lasting 25 times longer than incandescent bulbs. Compared to fluorescent lights, LEDs use up to 60% less electricity and have a three times longer lifespan, offering significant advantages. India boasts one of the largest lighting markets globally,



presenting a compelling opportunity for LED manufacturers to establish facilities due to factors like skilled labor, business-friendly practices, and demographic advantages, fostering sustainability in the LED industry. General lighting, backlighting, signal, and signage are common LED applications in India. Furthermore, innovations in the commercial lighting market is influenced by factors like energy cost reduction and thus offers a means of upgrading LED lights to the consumers requirement. It also provides a convenient way to enhance the interior environments with advancements such as artificial intelligence to optimize functionality. India's biggest export destinations in white goods are United Arab Emirates, Sri Lanka, and the United States. India's imports primarily come from China, Thailand, and Vietnam in the sector. Due to several favorable factors, LED lights are swiftly replacing traditional bulbs in India. The versatile application of LEDs in medical devices, automotive, aviation, entertainment etc. is driving the market's expansion. Rapid urbanization, surge in infrastructure development, including

highways, commercial malls, and airports, further fuels this demand.

India's LED lighting market size alone is expected to reach \$2.68 billion by 2029, at a CAGR of 9% from 2022 to 2029, as per GreyViews, a market research firm. The Production-Linked Incentive (PLI) scheme aims to boost core components like LED Chip Packaging, Resistors, ICs, Fuses, and others, encouraging a robust ecosystem and increasing value addition to 40-45% in LED lights. This initiative is expected to positively impact the automotive sector, projected to grow at a 21% CAGR. Over five years, the PLI scheme is estimated to result in over \$23 billion in incremental production, exports exceeding \$8.8 billion, and the creation of four lakh direct and indirect employment opportunities.

**Challenges**

Though Indian LED market has come a long way in the last decade but still India remains a net importer of LED bulbs. The LED lighting lacks strong linkages with the research and development labs, manufacturing units and supply chain management. Strong multifaceted

policies to distribute bulbs to local households and work on innovative production at the manufacturing end is required essentially. Many new manufacturers cannot avail the benefits of the PLI-WG scheme due to ineligibility to cross the threshold decided for minimum requirement. State governments need to introduce lighting specific policies to escalate the supply of LEDs and reduce the regional imbalance.

**Way Forward**

It is estimated that India annually imports LED Lights components valued at approximately INR 12,000 crore. According to Report by Grand View Research, Global LED lighting market was approximately USD 50.91 billion in 2020 and is expected to grow to approx. USD 135.58 billion by 2028 at CAGR of 12.5%. Improvement in bulb quality and focus on long term planning and favorable government initiatives with international treaties can reinforce domestic lighting industry with substantial support and resources to expand their output and sales worldwide.

**Conclusion**

LED usage has become widespread, particularly among the middle class, due to its affordability, cost-effectiveness and growing awareness. Recognized for its efficiency and durability, LED lighting has become a smart solution. Constant efforts of Indian government to reinvigorate the manufacturing sector has turned out to be successful. PLI scheme has undoubtedly contributed in increasing its global share in lighting industry. With further collaboration and innovation Indian industry can extend its services effectively.

**AUTHOR : DR. B.K.PANDEY, PROFESSOR OF PRACTICE (ECONOMICS), AJNIFM**

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# PLI LED Lighting progress study by AJNIFM

Department for Promotion of Industry and Internal Trade (DPPIT) has engaged the Arun Jaitley National Institute of Financial Management (AJNIFM), Faridabad, an autonomous Institution of the Ministry of Finance, to conduct a study for assessing the impact of PLI scheme for White Goods including the robustness of its systems, processes, monitoring and control mechanisms and socio-economic impact. In order to undertake this activity, (AJNIFM) have been holding detailed interactions with PLI beneficiaries, sectoral Industry Associations and other stakeholders.

AJNIFM has tasked a team consisting of Dr. BK Pandey, Professor of Practice, AJNIFM- Project Coordinator, Ms. Babni Lal, Ex-Senior Economic Adviser, Ministry of Textile, Mr. Rajat Sachar, Ex-Principal Economic Advisor, DPIIT, Prof. Satyen Lama, Professor of Practice, AJNIFM, Mr. Rishab Aggarwal, Finance expert, Ms. Shweta

Yadav, Ms. Areeba Furqan and Dr. Shreya Saha, Research Associates, AJNIFM to prepare the study report

Dr. B.K. Pandey and the AJNIFM team visited ELCOMA office in November 2023.

The ELCOMA Secretariat was represented by Mr. Amal Sengupta and Mr. Rajesh Kachwaya and Mr. Nitish Poonia, Signify Innovations, Mr. Amit Kumar Sharma, Surya Roshni and Mr. Vijay Gopal Gupta, Surya Roshni represented ELCOMA members during the meeting.

During the discussions, the delegates from AJNIFM requested ELCOMA to explain the basic technical aspects related LED lights and its components. Mr. Nitish Poonia presented a basic overview of LED technology and LED lights and the components that are used in the manufacturing of LED light products.

The AJNIFM team also discussed

several issues with the ELCOMA representatives

- The market size of the LED industry in India, broken down by components and finished products.
- The percentage of finished LED and components imported into the Indian market
- The import intensity of component production at present and the current and future levels for its localization in the country and road map for localization of LED component manufacturing like PCB, MCB, etc.
- Some insights into the export and import trends in this industry in the last 5 years and the major sources of import and direction of export in value and volume terms
- The current status of the Production-Linked Incentive (PLI) scheme for the LED industry in India in terms of overall investment, employment, and import substitution, and its

significance in terms of socio-economic development and the production ecosystem in the country.

- The estimated degree of localization in raw materials and components both before and after the initiation of the PLI-WG Scheme.
- Views/Feedback on the robustness of the scheme guidelines and the criteria for selecting products



AJNIFM team with ELCOMA members during their visit



and sub-components being fair and transparent.

- An assessment of the incremental employment generated and for women employment since the inception of the scheme.
- The estimated number of patent applications received since the initiation of the PLI-Scheme on White Goods.
- The aggregate change in income generated of the employees following the implementation of the Scheme.
- The recommendations that the Lighting Industry propose for the future course of the scheme and any potential revisions.

The issue of non-compliant BIS LED lighting products that are sold in the market was also discussed. ELCOMA explained the pressing issue about 35%



of the market being occupied by these products and this is a point of serious concern from Consumers' point of view as such non-compliant products have potential safety and under performance issues which have been bothering the industry for a long time. It was also explained to them ELCOMA in recent communications with MEITY, BIS, and Ministry of Commerce have supported the shift from Scheme II to Scheme I of

the Conformity Assessment Regulations, where assessment of manufacturing facility of the applicant is mandatory requirement for grant of certification by the authority. ELCOMA requested the support of AJNIFM to take up this matter at appropriate levels.

The meeting came to an end with thanks from all ELCOMA members to the AJNIFM team.

## INDUSTRY NEWS

## Mr Amal Sengupta takes over as Secretary General of ELCOMA

Mr. Shyam Sujan has retired from the post of Secretary General of ELCOMA as of October 31, 2023. Mr. Amal Sengupta has been appointed as Secretary General of ELCOMA with effect from November 1, 2023.

All communications to Secretary General, ELCOMA may please be sent to:

Mr. Amal Sengupta

Secretary General

Electric Lamp and Component Manufacturers Association of India (ELCOMA)

115, 1st Floor, DLF Tower-A, Jasola District Centre, Jasola Vihar, New Delhi-110025

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# Signify's Ratri Chaupal program creates safer spaces for rural women

With an aim to create safer spaces for women living in rural villages, Signify has launched a first-of-its-kind CSR program called Ratri Chaupal in India. Under this program, the company is illuminating communal spaces in villages to enable women to gather safely after sunset and attend night school and various information sessions on health, nutrition, agriculture, women safety, government schemes and financial literacy.

The company has partnered with Srushti Seva Samiti to launch the pilot project in 10 villages in the Mavli block of Udaipur, Rajasthan. The project was launched by Shri Jagdish Raj Shrimali, Honorable Minister of State & Vice Chairman, Labor Advisory Board, Rajasthan.

The program aims to positively impact more than 7,500 women and children in

the district, by conducting sessions on health, nutrition, agricultural techniques and financial literacy. The project also expects to increase the participation of women in night schools and support the village households with enrollment support for government schemes.

Commenting on the launch, Nikhil Gupta, Head of Commercial Operations, Marketing and CSR, Signify Innovations India Limited, said, "With a vision to unlock the extraordinary potential of light for brighter lives and a better world, Signify is committed to make people's lives safer. One of the most significant factors affecting the safety

and well-being of women and families living in villages is the lack of adequate lighting after sunset. With a unique program like Ratri Chaupal, Signify will enable women to participate more actively in their local communities, giving them more time to pursue education, social and financial literacy programs and community involvement in a safe environment"

Speaking at the launch event, Shyam Sundar Bhatt, Chairman, Srushti Seva Samiti commented, "It has been a great association working with Signify to create this unique and impactful Ratri Chaupal



program. Women living in villages are afraid to venture out after sunset due to lack of adequate illumination, and as a result they miss out on opportunities to attend night school, learn about various social and financial schemes run by the government or simply engage with other members of the community. With this program, we have created a safe space for these women to connect with each other every evening and gain access to education and information, that can have a significant impact on their future."

Additionally, the illuminated community centers will also function as libraries, open to all, when not in use for the chaupal sessions. After the success of the pilot project in Udaipur, Signify plans to expand this program to 10 more villages in other districts in Rajasthan.

**AUTHOR : SIGNIFY INNOVATIONS INDIA LIMITED**

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# Shaping a Brighter Tomorrow: The Circular Economy Revolution in the Lighting Industry

In a world that is becoming increasingly conscious of its environmental footprint, industries are seeking innovative ways to transform their practices. The lighting industry, a cornerstone of modern living, is no exception. Embracing the principles of the circular economy, it is evolving to illuminate our lives more sustainably and responsibly.

## A Paradigm Shift in Illumination: From Linear to Circular

Traditionally, the lighting industry followed a linear model that consisted of manufacture, consume and dispose off. However, this linear approach has proven unsustainable, leading to resource depletion, environmental degradation and a growing waste problem. Enter the circular economy, a model designed to minimize waste and make the most of resources. In the lighting industry, this shift involves reimagining the lifecycle of lighting products. Manufacturers are now exploring ways to design products with longevity in mind, making them easier to repair, upgrade and ultimately, recycle.



## Designing for Durability and Efficiency

Circular economy principles encourage the production of durable and energy-efficient lighting solutions. Manufacturers are investing in research and development to create products that not only shine brightly but also have extended lifespans. LED technology, with its low energy consumption and long lifespan, has become a frontrunner in the quest for sustainable lighting.

Additionally, modular design is gaining popularity, allowing components to be easily replaced or upgraded. This not only reduces the need for frequent replacements but also minimizes electronic waste.

## Closing the Loop: Recycling and Upcycling

The circular economy isn't just about extending the life of products; it's about what happens when they reach the end of their lifecycle. Recycling initiatives are gaining momentum, with companies exploring ways to collect and recycle old lighting fixtures. Materials such as aluminium, glass, and certain plastics can be reclaimed and reused, reducing

the demand for virgin resources.

Moreover, some manufacturers are embracing upcycling—the process of transforming waste materials into new, higher-value products. Old lighting fixtures can find new life as unique and artistic pieces, further reducing the environmental

impact.

## From Ownership to Service Models

A radical shift in consumer behaviour is also contributing to the circular economy in the lighting industry. Instead of owning lighting products outright, consumers are increasingly turning to service models. Lighting as a Service (LaaS) allows users to pay for the illumination they need without the burden of ownership. This encourages manufacturers to design products that can be easily recovered, refurbished and reused in a continuous loop.

## Challenges and Opportunities

While the circular economy brings immense promise to the lighting industry, it is not without its challenges. Implementation requires collaboration across the entire value chain, from manufacturers to consumers. Standardization of materials and recycling processes is crucial for efficiency.

However, the rewards of embracing circular economy principles are worth the effort. Beyond environmental benefits, companies can find new business opportunities, reduce operational costs, and strengthen their brand image by aligning with sustainability goals.

The transition to a circular economy in the lighting industry represents a beacon of hope for a more sustainable future. As manufacturers, consumers, and policymakers collaborate to illuminate the path forward, the industry is not just lighting up spaces but also lighting the way for a brighter, more sustainable tomorrow.

**AUTHOR : PRASHANT THORAT, HEAD OF MARKETING, PROFESSIONAL LIGHTING, BAJAJ ELECTRICALS LIMITED**

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# CPCB Clarification Issued on EPR registration

Our members reported that the CPCB portal for EPR registration of manufacturers was not started and they were struggling when CPCB instructed all ports' customs to disallow customs clearance in case the importing company is not registered on CPCB portal under new E waste rules 2022.

ELCOMA with some of the members submitted a representation to CPCB and MOEF&CC requesting to resolve this issue.

Central Pollution Control Board, Waste Management –III Division has issued a Clarification wide File No: CP-22/29/2023-WM-III-HO-CPCB-HO dated 28.12.2023. This notification is addressed to Custom / Port Authorities, State Pollution Control Boards, Pollution Control Committees, Manufacturers, Consumers and Bulk Consumers. The details of the notification are as follows:

Registration on the E-Waste EPR Portal as a Producer is **NOT** required by the entities in case of:

- 1 Import of Electrical and Electronic Equipment (EEE) (including their components, consumables, parts and spare) not listed in the Schedule-I of E-Waste (Management) Rules, 2022.
- 2 Import of Electrical and Electronic Equipment (including their components, consumables, parts and

spare) listed in the Schedule-I of E-Waste (Management) Rules, 2022 for the purpose of:

- a Selling to Producers already registered on the E-Waste EPR Portal available at URL: <https://eprewastecpcb.in>, only;
- b Self-Use (Not for Sale);
- c Captive Consumption for manufacturing and selling to Producers already registered on the E-Waste EPR Portal available at URL: <https://eprewastecpcb.in>

Provided that the entities (importers), other than covered under the categories at S.No.1 mentioned above, shall submit the following documents to Customs / Port Authorities along with a proof that they have submitted copy of the below mentioned document to CPCB also at the e-mail id [ewaste2.cpcb@gov.in](mailto:ewaste2.cpcb@gov.in):

- Copy of agreements with Registered Producers for whom the consignment is being imported.
- Copy of EPR Registration Certificate of the Producer(s) for whom the consignment is being imported.
- Letter from Registered Producers that Importer is importing on behalf of the said Registered

Producer.

- Self-declaration that imported EEE items shall be sold to registered Producers only and shall not be sold to any individual/consumer/ bulk consumer (as per format attached).
- 3 Consumers or Bulk Consumers importing Electrical and Electronic Equipment (EEE) for self or captive use, provided that the Consumer or Bulk consumer submits Self-Declaration to Customs/Port Authorities on its letter head that EEE items being imported are intended only for self or captive use and not for sale (as per format attached) along with a proof that they have submitted copy of the self-declaration to CPCB also at the e-mail id [ewaste2.cpcb@gov.in](mailto:ewaste2.cpcb@gov.in).

With the issuance of this notification it now allows Manufacturers, Bulk consumers and consumers to import the electronic and electrical equipment (EEE), Parts, spare parts, consumables etc. as listed in Schedule -1 of the rules, without registering as Producers on the CPCB portal until further notice.

In due course of time, it has been informed that CPCB portal shall also open for registration to “Manufacturers” to register each of the applicable manufacturing plant on the CPCB portal.

## Format for Self Declaration

### Self- Declaration (On Company Letter head)

We, M/s \_\_\_\_\_ hereby declare that imported EEE items codes \_\_\_\_\_ shall be for selling to producer already registered on the EPR portal/for self-use ( Not for Sale ) /for captive consumption for manufacturing and selling to producer already registered on the EPR Portal/self or captive use and shall not be sold to any individual/consumer/bulk consumer\*\*

We also hereby undertake that all the responsibilities of correctness of information as provided above will be ours. In case of any information found false or misleading at any stage, action as per the rules may be initiated against us.

(Name and Signature of the Authorized Person )  
Designation:  
Company Seal

\*\* Strike out whichever is not applicable

# New Product Planning an Art and a Science



**N**ew product planning is back bone of any sustainable business as it fuels business growth and ensures profitability for ongoing business operations. It is one of the most powerful tools for any business and if used with full efficiency has the ability to turn around any business model into a successful business.

Unfortunately, new product planning has always been underrated by most of the organizations and ended up as a part of either new product development or product offerings from vendors. Most lighting brands wish to hedge the risk of higher inventory and volatile business scenarios and due to shorter product life cycles brands prefer to buy from various OEMs which in turn limits innovation since they usually have to compromise with offerings that OEMs present to them. OEMs on their part, prefer to be risk averse since their primary objectives are to ensure profitability from existing

and/or ongoing products/product lines.

## What is New Product Planning?

Most people in the Lighting Industry consider New Product Planning as just providing new products to an organization. This is true to some extent however when you make quick analysis of the process of New product Planning, you realize there is lot of moving parts or pieces that must come together to successfully create and launch a product.

There a large number of steps, procedures and operations that constitute New Product Planning but these can primarily be classified into four Gateways or Phases.

### Gateway 1 or Ideation Phase

- Product Concept – (Inspiration)
- Market research on concept. (Internal / External)
- Analysis of market research to drive expected output.

- Summarize above all in project proposal with desired results.

### Gateway 2 or Go/No go Phase

- Investment calculation and ROI Calculation.
- Schedule Fixing.
- Risk and Backup plan.
- Go Ahead approval from Stake Holders.

### Gateway 3 or Execution Phase

- Project Execution.
- Tracking against Approved Schedule
- Trouble shooting during Execution.
- Final testing and feedback
- Improvements as per feedback.

### Gateway 4 or Launch, Monitor Phase

- Launch of product
- Product performance tracking and review against proposed results.
- Product lifecycle review & Management.
- Modification in product to improve life cycle.
- Discontinuation of product.

New product Planning doesn't finish just after launching new product it is a perpetual activity where many activities are handled simultaneously from the launch of the product to the end of life of said product which is also known as product life cycle management and includes product performance review and discontinuation or phase in phase out of product.

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Views expressed in this article are those of the contributors and do not necessarily reflect those of the editors or publishers

# Standards and Regulations Update

## Illumination Engineering and Luminaires Sectional Committee, ETD 49

ETD49 Committee meeting was held on 9th Nov-23, whereas, The committee discussed the ToR and following was decided:

- 1 Electrical Installations for Lighting and Beaconing of Aerodromes Characteristics of Inset and Elevated Luminaires Used on Aerodromes and Heliports- Approved with no changes
- 2 Revision of IS 7537: 1974 'Specification for road traffic signals'- Approved with the following change in research methodology
  - a Wider consultation with

industries/ experts and relevant authorized persons.

- 3 Revision of IS 12309 Series 'Code of practice for installation and maintenance of aerodrome lighting fittings'- Approved with no changes
- 4 Revision of IS 9583: 1981 'Specification for emergency lighting units'- Approved with no changes
- 5 Revision of IS 13383 Series 'Photometry of luminaires - Method of measurement'- Approved with no changes
- 6 Indian Standards on 'Intelligent & Connected LED Lighting'- Approved with no changes

### ETD23 Committee Meeting Update

Review/Reaffirmation of Indian

standards: As per the guidelines, published Indian Standards should be reviewed after every five years. If no revision is called for, the standard(s) may be re-affirmed. Reaffirmation of the standard(s), however, does not prevent these standard(s) being taken up for revision. In accordance with laid down procedures, all published Indian Standards should be reviewed by their respective Sectional Committees every five years after its publication. Indian Standards under ETD 23 due for review are as follows:

### QR Code Implementation of BEE

Under S&L scheme for Self-Ballasted LED Lamps, BEE has issued an advisory that all the Permittees / Manufacturers of Self Ballasted LED Lamp to produce the LED Lamp w/o QR code until further information.

As per the revised BEE star rating notification, implementation of QR code was supposed to be enforced from 1st Jan-2024.

**AUTHOR : SANTOSH AGNIHOTRI (CHAIRPERSON, ELCOMA TECHNICAL COMMITTEE) AND GENERAL MANAGER- QUALITY & TECHNICAL, ORIENT ELECTRIC LIMITED**

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S. No.	IS Number	Title
1.	IS 15974: 2013	Auxiliaries for lamps starting devices (Other Than Glow Starters) - Performance requirements
2.	IS 2596: 2004	Bulbs (Lamps) for Miners' Cap-Lamps
3.	IS 418: 2004	Tungsten filament lamps for domestic and similar general lighting purposes (Fourth Revision)
4.	IS 15882: 2009	Ballasts for discharge lamps (Excluding Tubular Fluorescent Lamps) - Performance requirements
5.	IS 16148: 2014 IEC61167:2011	Metal halide lamps - Performance specification
6.	IS 16166: 2014 IEC 62554:2011	Sample preparation for measurement of mercury level in fluorescent lamps

(MoM of the committee meeting is not published yet)

## INDUSTRY NEWS

# Surya receives Best Industry Award

The 31 st Chapter Convention on Quality Concepts – 2023 by QCFI, Gwalior was held in September at IIITM Gwalior. A total of 96 teams participated from various industries and schools including 4 teams from Surya Roshni Limited, Lighting Division, Malanpur that presented their case studies. All these 4 teams

successfully presented their individual case presentations and were recognised by Jury members and were awarded GOLD LEVEL and Qualified for National Convention scheduled at QCFI Nagpur.

Surya Roshni Limited also received the Best Industries Award.



# Signify launches Philips Mod COB

Signify, recently launched Philips Mod COB, a unique product designed to create lighting that perfectly complements your aesthetic taste. It elevates your home's ambience and offers unparalleled freedom in lighting customization, making your spaces come alive with lighting that blends with the decor. Available in 2 wattages, 7W and 12W, the product offers 2964 lighting combinations, three beam angles with angular tilt, and a Color Rendering Index (CRI) >90 and various customizing options. With all these features, the Philips Mod COB is set to redefine the way we experience home lighting.

The key features of the Philips Mod COB are

**Countless Lighting Combinations:** With 2964 lighting combinations, users can experience the freedom to create lighting that perfectly complements the decor, allowing them to curate the ideal ambience for every space.



**Versatile Beam Angles:** With three beam angles (150, 240, 360) and angular tilt, Mod COB provides the flexibility to accentuate any decor's highlights with style and convenience.

**Enhanced Color Rendering with 90 CRI:** Mod COB's Color Rendering Index (CRI) surpasses 90, ensuring enhanced color rendering that reveals the true colors of the surroundings. Unlike most

other LED products, Mod COB showcases objects in their authentic colors, providing an unparalleled visual experience.

**Options for Personalized Lighting:** Mod COB is available in 11 captivating colors, and 4 shapes (square, circle, oval and semi-circle) and with 4 types of mounting grids (Square, surface, round and trimless).

# LUKER's Launches AZURO DMX LED Lighting

Experience the future of outdoor lighting with LUKER's AZURO DMX LED range.

Ideal for landmarks, monuments, parks, resorts, and bridges, these lights offer dynamic illumination controlled by major DMX systems. Customers can choose from RGB/RGBW Focus lights, Projector lights, and Linear Wall Washers in various wattages.

LUKER's AZURO DMX LED range revolutionizes outdoor brilliance.



# Halonix Technologies launches India's first 'UP-DOWN GLOW' LED Bulb

**H**alonix Technologies recently announced the launch of India's first 'UP-DOWN GLOW' LED Bulb, demonstrating its commitment to enriching lives through pioneering technology. As the name suggests, both the upper part (Dome) and the lower part (stem) glow in different colours, giving consumers different options of creating some magic with the lighting in their room through 3 different switch enabled modes.

The 10W 'UP-DOWN GLOW' LED Bulb offers two variants, each with three lighting modes: the first variant provides white, warm, and mixed lighting, while the second offers white, blue, and mixed lighting options. In the first mode a bright 10 watt light glows at the top

(dome). Toggle the switch to go to the next mode where the stem glows blue/warm white to give a soothing hue on the wall. Toggle the switch once more to get a bright white light above and a soothing blue/warm yellow light at the bottom (Stem) that gives a unique look to the ambience in the room.

Its 360-degree illuminance provides consistent, even lighting and brings a new dimension to the room lighting.



Further more, its convenient design allows for easy installation in existing light bulb holders.

# Empower illumination with JAP's 50W LED Driver

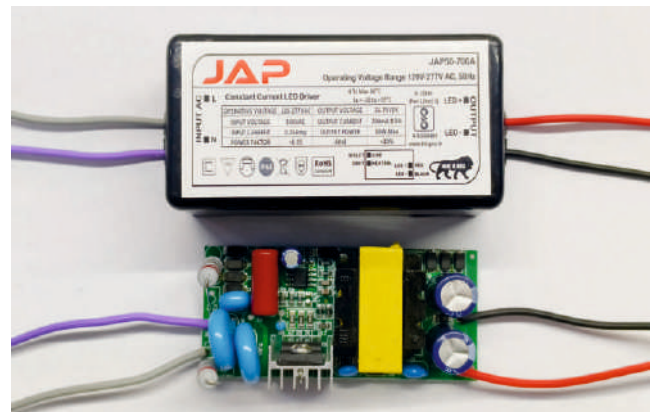
**J**AP has recently unveiled their latest innovation – the JAP 50W LED Driver. Elevating the standards in LED Driver technology, this innovation encompasses a perfect blend of unwavering reliability and affordable price.

The JAP 50W LED Driver is meticulously engineered for optimal performance, delivering a seamless and energy efficient solution for diverse lighting needs. Its high efficiency ensures effective power utilization, paving the way for substantial reduction in energy consumption. The 50W driver is available with 700mA and 1500mA current options, designed to meet the specific requirements of the Indian market. The product also has a wide

input voltage range of 120-277VAC at 50-60Hz, that ensures that the LED Driver seamlessly adapts to various electrical systems, catering to the dynamic needs of lighting applications. The JAP 50W LED Driver come with a 6KV Surge immunity that ensures reliability even in challenging conditions.

Recognizing the significance of cost-effective solutions without compromising on quality, the JAP 50W LED Driver strikes an ideal balance. This makes it an attractive choice for leading lighting manufacturers in

India seeking to maximize business opportunities and profits. Designed with compatibility in mind, the JAP 50W LED driver seamlessly integrates with various lighting systems, streamlining the integration process for manufacturers.





# Signify wins the Golden Peacock Innovation Management Award 2023



Signify wins the Golden Peacock Innovation Management Award for the year 2023 in Electricals category from IOD (Institute of Directors) at at IOD's 18th International Conference on Corporate Social Responsibility.

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*ELCOMA Member's Directory for year 2022-2023 is now released. Interested stake holders may write for a free copy to deepakkumar@elcomaindia.com*



# Power gone Light ON

## Presenting Orient Electric Emergency LED Lights



Lights will be automatically switched ON to Emergency mode during power cut

Automatically recharges when power is ON

### APPLICATIONS



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