VOL.1 Issue 2

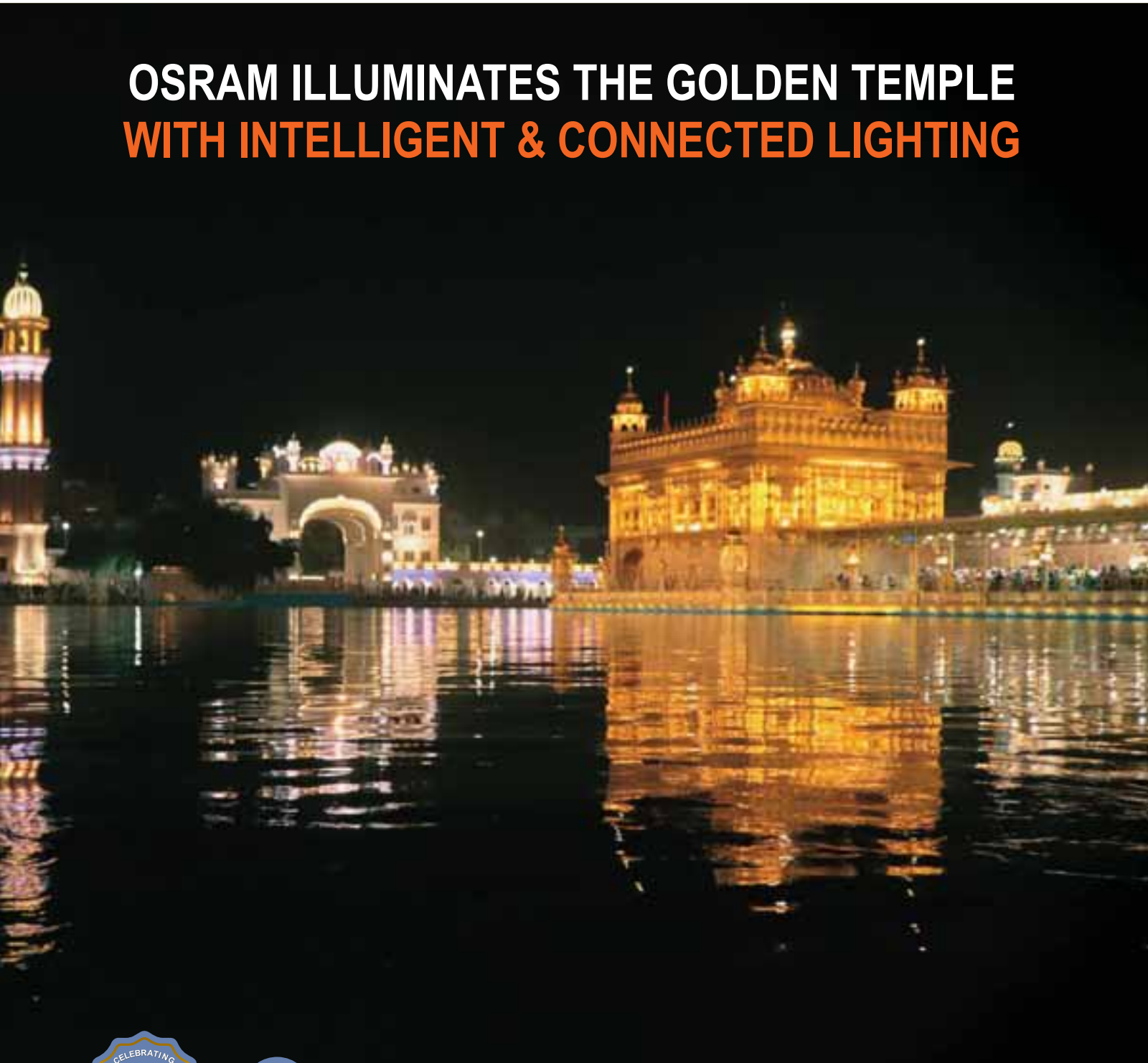
COMPLIMENTARY COPY
₹100

IllumiNation

APRIL 2019

THE LIGHTING MAGAZINE

OSRAM ILLUMINATES THE GOLDEN TEMPLE WITH INTELLIGENT & CONNECTED LIGHTING



CELEBRATING 50 YEARS OF SERVICE TO LIGHTING INDUSTRY

elcoma

ELECTRIC LAMP & COMPONENT MANUFACTURERS' ASSOCIATION OF INDIA | www.elcomaindia.com

Light is Sacred

As the global leader of media and digital solutions, Traxon e:cue transforms creative visions into unforgettable experiences, elevating entertainment, smart city, industry and office environments around the world.

Light is OSRAM

Our Brands

traxon e:cue

OSRAM

HAVELLS

THINK LED. THINK HAVELLS.

See your world in a new light with the complete range of LED lighting solutions from Havells.

www.havells.com
marketing@havells.com

buy online**
shop.havells.com

/havells
/havellsindia
/havellsindia
/havells_india

HAVELLS CONNECT

Toll Free No.: 1800 11 0303 (Toll Free), 011-4166 0303 (Landline), 1800 103 1313 (All Connections).
For dealer interested in opening new Havells Galaxy Store, please e-mail at: galaxy@havells.com

CONTENTS

OFFBEAT

Raju Bista
President, ELCOMA

Sumit Padmakar Joshi
Vice President, ELCOMA

Arvinder Singh
Treasurer, ELCOMA

Sunil Sikka
Advisor, ELCOMA

EDITORIAL BOARD

Sudeshna Mukhopadhya

Krishan Sujan

Sudeshna Das

HIGHLIGHTS OF NEXT ISSUE

- Chat Time with Raju Bista, President ELCOMA
- E-vehicles : EESL to enter into new avenues for energy efficiency
- Reminiscences of 50 years of ELCOMA
- Wall of Fame

IlluminNation

VOL.1 Issue 2, April 2019

PUBLISHER
Shyam Sujan
Electric Lamp and Component Manufacturers' Association of India
202, 2nd Floor, DLF Tower-A, Jasola District Centre, Jasola Vihar, New Delhi -110025
Tel: 011-41556644/46604947

EDITOR
Shyam Sujan,
Secretary General, ELCOMA

EDITORIAL BOARD
Sudeshna Mukhopadhya
Krishan Sujan
Sudeshna Das

EDITORIAL CONTACT
sudeshna.das@elcomaindia.com

MARKETING & ADVERTISEMENT CONTACT
Nikita Gupta
nikita@elcomaindia.com

Printed & Published by Shyam Sujan on behalf of Electric Lamp and Component Manufacturers' Association of India, 202, 2nd Floor, DLF Tower-A, Jasola District Centre, Jasola Vihar, New Delhi - 110025, Tel: 011-41556644/46604947

ILLUMINATING THE WAY

This third issue of IllumiNation has been published after incorporating a large number of inputs from our readers. The layout and design of the magazine has been improved and keeping in mind emerging technologies, incorporates an essence of intelligent lighting. I am sure that the new look and feel will enhance the reading pleasure for our readers.

All disruptive technologies eventually affect the end consumer. Manufacturers have to keep designing and manufacturing newer and improved products which have better utility for the consumer or provide a unique proposition that makes the consumer buy it.

LED Lighting has moved from "application" lighting to "smart" lighting and is now moving towards futuristic "intelligent" lighting. With time, each successive month and each year, will bring better innovations, technology advancements and newer, better and more advanced products that offer new features and utility to the user.

ELCOMA is at the forefront of this technology leap and is keeping a close watch on new and emerging technological developments. Accordingly, we encourage the sharing of knowledge, understanding and spread of education about new developments and emerging technologies by holding various conferences for stake holders from time to time. At least three conferences are planned this year as part of this initiative.

It is essential to support all new technologies with appropriate and suitable skills development and training. In this direction, ELCOMA has always prepared programs for skills training for technicians supporting installation, monitoring and after sales service. We have already trained more than 1200 technicians for EESL, and are continuing the same. We have extended this skills program to Solar Street Lighting technicians and to support our members, we have prepared various programs for Domestic Electricians in different fields like appliances, white goods, lighting etc in collaboration with Electronic Sector Skills Council of India (ESSCI). Under this program, Domestic Electricians can be trained through CSR programs and we hope that eventually every electrician visiting our homes for any repair or installation will be a certified electrician carrying appropriate tools and armed with the requisite knowledge for carrying out his work.

Another future technology is LVDC (Low Voltage Direct Current). Instead of 230V, the entire electricity supply system will change to 50V DC. This has the capability to completely change the profile of products, their performance, safety, security and energy saving paradigms, etc. In this issue we are introducing LVDC with the help of an article by prominent proponents of this technology. ELCOMA is also organizing a conference fully focused on LVDC, its implications and the aspect of impacts such a technology would have on product profiles etc.

I am thankful to all the team members, without whose hard work we would not have been able to bring this magazine to you.

SHYAM SUJAN
Secretary General
Electric Lamp and Component Manufacturers Association of India (ELCOMA)

Fiem

LIGHT UP THE WORLD

LED LIGHTING

Innovative Design
Superb Performance
Save Power
Save Money

Cert No. T-3799 & T-6503
NABL Accredited
Photometric Lab

IS-16102
(PART I):2012

R-84000515

3
MORE STARTS, MORE SAVINGS

Long Life upto
25,000 hrs

Save Energy upto 80%

BULBS

PANEL LIGHTS

TUBE LIGHTS

DOWN LIGHTS

SURFACE LIGHTS

FLOOD LIGHTS

HI-BAY LIGHTS

STREET LIGHTS

BOLLARDS

SOLAR LANTERNS

LOW CARBON · MERCURY FREE · ZERO MAINTENANCE · ECO-FRIENDLY · HARMLESS EYES

Fiem Industries Ltd.

CORPORATE OFFICE & LED MARKETING DIVISION
Aria Commercial Tower, (Unit No. 1A & 1C), 1st Floor,
J.W. Marriott Hotel, Aerocity, New Delhi -110037
Tel.: 9821795327/28/29/30

Website: www.fiemindustries.com

Email: ledsales@fiemindustries.com

SCAN TO
VISIT WEBSITE

PREPARING FOR FUTURE LIGHTING NEEDS

LED Lighting has now created a space in retail outlets, domestic households and commercial applications. But we still find that the main use of LED Lamps today is to only provide light at the flick of a switch. It is just another Lamp with an on and an off switch, which is used to illuminate a certain physical space as per the user's need. A vast majority of end users of lighting still have very basic and very simple needs.

However, we can see that this scenario is changing, and the change is arriving very fast. The biggest advantage of LED lighting is that it is a very versatile technology that can be fitted into many different kinds of applications – from decorative lighting to growing plants in space. The lighting of tomorrow has to be very different from the 'vanilla' lighting applications we see today. Lighting systems will need to adjust to your needs and to your requirements. It has also to be very efficient. And without any doubt, it has to have a very long life. LED Lighting systems are emerging as wonderful, flexible and versatile products that not only provide illumination but are also very intelligent, can be part of a data network, can be controlled remotely, can react to your needs/requirements, can talk to each other and do so many more things to make our lives easier.

This change is happening in all technology applications and devices including cameras, refrigerators, streetlights, automotive lighting, home lighting systems, etc. In the medical field, physicians, for example, want to raise and lower the illumination or even change colors in examination rooms and operating rooms to suit their specific requirements. At home, you can change moods and atmosphere by changing hue and intensity of light. Similarly, in the automobile industry, automakers want to be able to play with colours of their vehicle interiors with the right kind of lighting and they also want smart headlights that adapt to road conditions.

LED products of tomorrow are going to be cross-functional and cross-industry and to satisfy all these requirements and to make such products more efficient and dynamic, we will need much more intelligent controls that will lead to a different generation and breed of drivers and controllers. The drivers of the future have to be intelligent, dynamic, miniature, long lasting and efficient. But even the current generation of LED drivers can do a lot more than required, if we design and use them optimally.

One of the best parts of LED technology is that it is based on DC. The government's initiative to explore the conversion of present power supply from AC to LVDC (Low Voltage Direct Current), could be very helpful in developing future products working on 50 Volts instead the wider AC range of 90V to 300V.

The Lighting Industry in India is already gearing up to meet future technologies which are going to be more reliable, efficient, intelligent and capable of producing longer lasting products.

RAJU BISTA
President, ELCOMA

HPL

Brightness that lasts on and on | illuminating every corner of your life.

When it comes to LED lighting technology, there is no better alternative than HPL.
The most elegant range of LEDs: low on power consumption,
low on maintenance and with customer satisfaction.

FEATURES:

SMD LED's for good quality illumination and longer life. | Constant current drivers. Highly efficient metal core PCB.
Superior quality diffuser for glare free distribution. Extruded aluminium heat sinks with specially designed fins.

OTHER LIGHTING PRODUCTS

LED Bulbs & Tubes | LED Downlighter | LED Panel | LED Highbay | LED Street Light

ECO light | LOW HEAT generation | energy saver

HPL Electric & Power Ltd
hpl@hplindia.com | Ph.: +91-120-4656300
Customer Care No. 1800 419 0198

www.hplindia.com

ARE WE HEADING TOWARDS ARTIFICIAL INTELLIGENCE?

Anil Bhasin, President, Havells India Limited, expresses his views on how artificial intelligence is going to cause a big disruption in lighting

In this modern age where technology is changing every day, customers are open to adapt to new technology changes like never before. They expect newer and better technology in every gadget and equipment starting from the watches we wear to the homes we live in and the cars that we drive.

The Lighting industry welcomes such changes and is working towards meeting these expectations of customers. To fulfil customer expectations, the focus of technology development moved from "Smart LED Lighting" to "Intelligent Lighting" and is now moving fast towards "Self-decisive (Edge based) LED lighting".

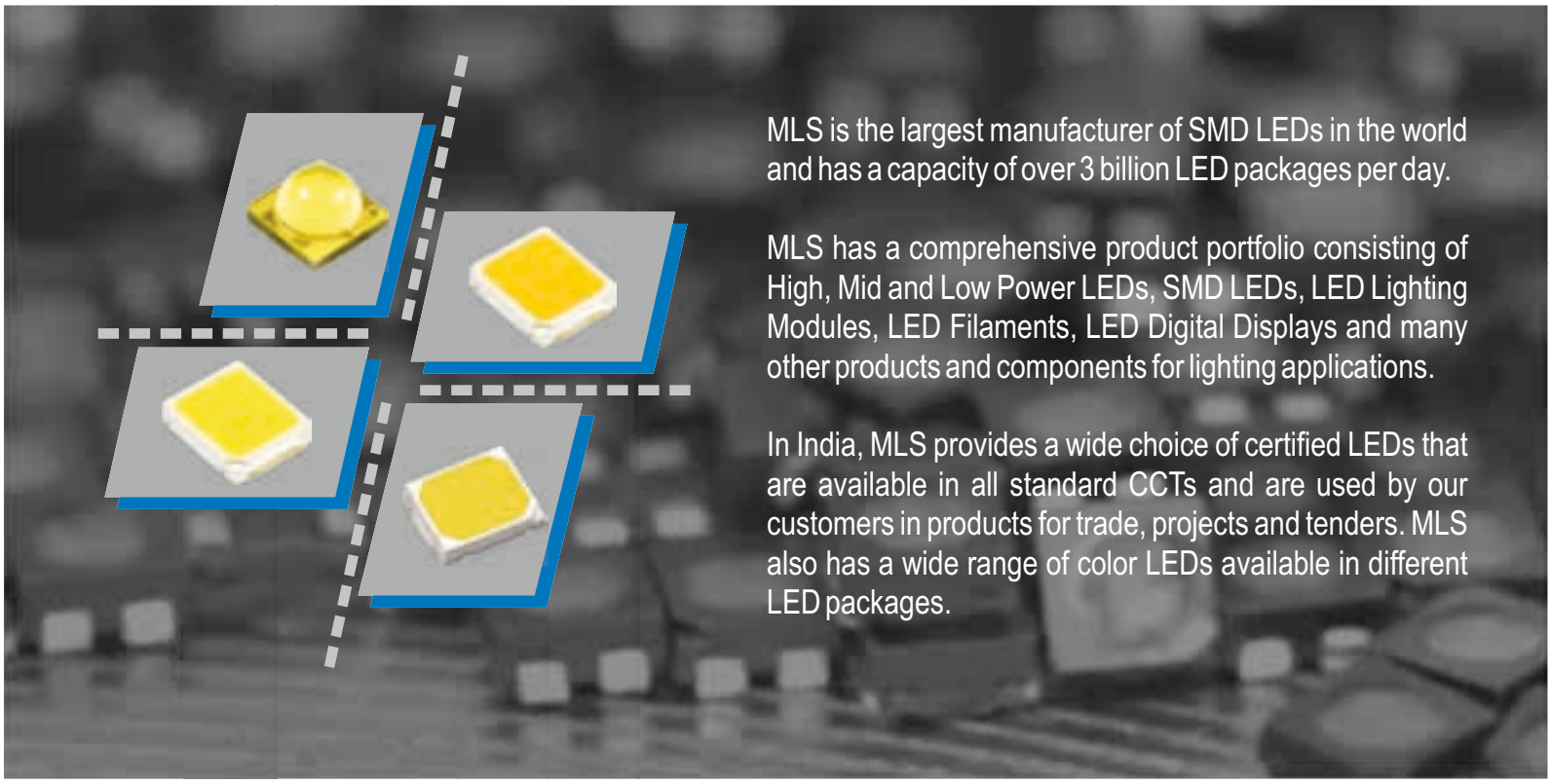
These changes can be seen in all the verticals of LED lighting, be it home, industrial, office or outdoor public lighting. The current demand of these verticals is not only to have individual or group control but also to monitor the performance and collect data from each and every light. This captured data is further used to abstract meaningful insight to make capable "decisions on the floor".

Technologically advanced companies have always understood the effectiveness of data well in advance and have made a successful business out of it. This captured data is now being used to develop Machine Learning (ML) for more accurate and faster response with Artificial Intelligence (AI) on the go.

Office and industry lighting is heading toward Industry 4.0 which will have individual light control and data collection as well as analysis at the platform level to implement AI based automation, which will have the least amount of human intervention. The same goes for outdoor lighting where the expectation is to have analytics inside the luminarie as well as "On the Road" edge based AI control and Cloud based monitoring.

Artificial Intelligence is causing big disruptions in financial, medical and industrial sectors and now is a good time to start thinking of developing platforms with AI in Lighting.

Author: ANIL BHASIN,
PRESIDENT, HAVELLS INDIA LIMITED



MLS is the largest manufacturer of SMD LEDs in the world and has a capacity of over 3 billion LED packages per day.

MLS has a comprehensive product portfolio consisting of High, Mid and Low Power LEDs, SMD LEDs, LED Lighting Modules, LED Filaments, LED Digital Displays and many other products and components for lighting applications.

In India, MLS provides a wide choice of certified LEDs that are available in all standard CCTs and are used by our customers in products for trade, projects and tenders. MLS also has a wide range of color LEDs available in different LED packages.

NO.1

The largest LED packaging company in the world

25,000+	TOP 3	4bn USD
Employees worldwide	Lighting company	Group Revenue

3,000,000,000

3 Billion LED packages per day

MLS INDIA PRIVATE LIMITED

714, 7th Floor, DLF Star Tower, Sector 30, NH-8, Gurgaon, Haryana 122003 +91-124-4867400/401
info@mlsindia.net www.mlsindia.net

"Rather than following what developed countries have done, we should focus on our journey to develop innovative lighting products as per Indian consumer requirements"

From spending his childhood in Kashmir, facing the hard times of migration during 90's to making unique contributions to the lighting industry, *Rakesh Zutshi, Managing Director, Halonix Technologies Limited*, has come a long way. In a conversation with *Sudeshna Das, Editorial Board Member* of IllumiNation, he shares his journey, perspectives and vision.

"For me, light has defined life. You know it is a very strong reflection of what your quality of life is, and what you can do with your life...

I feel that Light, from being a basic necessity at present, will become an integral part of our life and will become an enabler going forward. Being part of an industry that touches the lives of millions around the world is one of the reasons why I chose to be a part of the fascinating world of lighting ."

Rakesh Zutshi, Managing Director,
Halonix Technologies Limited

Q. Why did you select lighting as the field of your career growth?

For me, light has defined life. Light is a very strong reflection of what your quality of life is, and what you can do with your life. It may sound very clichéd if I say that we studied under candles and kerosene lamps but that's the reality as we have seen it when we grew up. Today we look around and see that light is available for more than seventy or eighty percent of the population which is quite heartening since it proves that as a country we have made some right moves over the last thirty or forty years. I feel that Light, from being a basic necessity at present, will become an integral part of our life and will become an enabler going forward. Being part of an industry that touches the lives of millions around the world is one of the reasons why I chose to be a part of the fascinating world of lighting.

Q. You have been in lighting Industry for a long time. During this period, a lot of technological transformation has taken place. Which is the most significant technology change you have witnessed?

The nature of light has evolved a lot technologically in past few years, especially since it has moved from electrical to semiconductors with the introduction of LED. Semiconductors have the ability of being controlled, moulded and adapted as per application requirements. They can also work with higher voltage range which translates into more brightness and light output. Other than that, the electrical to semiconductor evolution makes lighting smarter. An analogy would be the evolution of mobiles from feature phone to the smartphones of today. As a user, there is so much more you can do with smart lighting and there is so much more to explore.

This phase of lighting technology that we are in at present, is one of the most exciting phases, which will define how the industry moves in the future.

Q. LED being the most progressive technology, do you think Indian Lighting industry is fully geared to face the challenge of providing world class products as per Indian conditions?

I think, year the 2008-09, was the watershed year that saw the emergence of LED as a genuine solution for lighting. Until that time, it was there but not in the scale or price point that we thought it would be feasible in the industry. In 2015, a disruption of lighting industry happened in India with a push by the Government for LED lighting.

> We were not prepared for the speed at which it had happened. It happened very fast. Most of the companies were manufacturing millions of CFLs at that time. Our entire production capacity was geared towards CFLs and we thought that the transition to LED would take a couple of years, but all we got were a few months.

I think LED Lighting has benefited from the disruption being very abrupt, but it also put immense pressure on the lighting manufacturers and allowed the grey market to flourish in a big way because initially there were no specifications, regulations or safety standards.

The industry felt its bottom-lines shrinking as we faced an almost overnight transition from CFL to LED at a very low price. These prices were almost equal to the manufacturing cost. We could not go to the market with that cost because the retail market consists of distributors, retailers and everybody in the value chain needs to make some money for it to work.

EESL actually cut down that value chain. It was from the manufacturer directly to the supplier and from supplier to the end consumer. So there was no cost addition of the value chain in a normal retail set up, so brands/manufacturers found it hard to compete in the retail market. But the fact is that these government programs did help to build capacities and also helped to stabilise the market.

Once the LED market had been created, the organised sector did come in, and we started competing - we brought our cost down, got rid of our 'legacy costs'.

Today I can safely say that, LED lighting is a more matured product and there is a ready market that we are handling. Going forward we are looking at favourable legislation to support the industry and better and higher safety and product specifications and better surveillance. Once all this happens, I think we all are expecting that the organised sector market share would increase and the grey market would shrink.

Q. EESL played a very important role in bringing in LED bulbs and street lights in India on large scale. At the same time, it has eroded not only the manufacturers profits, but has also reduced retail prices substantially. Do you agree that the sacrifice by the industry is to be seen as a significant support in bringing in a new technology product within a very short time? Has the reduced procurement and consumer price been at the cost of the quality of products?

EESL has done a fantastic job in popularising LED lighting products and made those products affordable. It helped the industry into two ways: number one, it brought economy of scale; number two, it popularised the product. So, it created a market. I would say, if it was left to natural progression, maybe it would have taken ten years for LED lighting to become mainstream product. It was shortened to one year due to EESL and the scale was such that the entire lighting industry had to participate in EESL projects. But EESL projects had both, a positive impact and a negative impact on the industry.

Due to the low price mandate by EESL which led to reduction of price of 9W LED Bulbs from Rs 200-300 to Rs 40 within a period of one year, there was little or no scope for innovation. So in a way, EESL's projects made LED lighting popular but due to shortened timelines, it may have had an impact on quality and innovation. The fact is that organizations have to make money and these profits are used to develop smarter and better products. If you don't make money, your focus is on cost cutting rather than innovation and technology.

I feel that EESL has done a wonderful job and an industry has been created. But now they should allow the lighting industry to mature in a natural way.

Q. Does Connected Lighting or Intelligent Lighting have any future in India? If so, what are the requirements that Indian industry needs to prepare for?

When we talk about connected or inter-connected lighting in India, in my view we are actually talking about smart lighting. India's journey is going to be very different from the rest of the world since we are a developing nation, where developed technology is being brought in. Our infrastructure poses different challenges from the rest of the world - power, power distribution, roads are just some of the bumps on our journey. Somewhere there will be a marriage between our infrastructure and these emerging technologies which would be very different from what the world is experiencing. I have my serious doubts that what is happening in Europe or China today can be replicated in India. I think you will see a journey which is very Indian in nature - it will be an adaptation, it will be a unique solution that India will come up with.

When we talk about inter-connected devices, phones will be the keystone around which such offerings will revolve. I can only talk about three to five years' horizon because it is very possible that some technical innovations would take place which might make LEDs look as dated as lanterns.

India has its own challenges and unique problems. One of the first issues for any new technology is affordability for the masses – how many people can afford an inter-connected home? Secondly, is our infrastructure ready for such solutions?

"EESL's projects made LED lighting popular but due to shortened timelines, it may have had an impact on quality and innovation...

EESL has done a wonderful job and an industry has been created. But now they should allow the lighting industry to mature in a natural way."

Rakesh Zutshi, Managing Director, Halonix Technologies Limited

Thirdly, is there a need for it? For example, in Europe people control their home and car's locking mechanism using smart phones. In India, would you need/choose such a solution knowing that anytime your WiFi/mobile connection could drop, or you could run out of charge and could be locked out of your home?

On the other hand, the control and connectivity that LEDs provide for institutional, commercial and projects makes immense sense. The power quality is much better and there are so many applications of this technology in these segments. The biggest application of connected lighting in India at present is Street Lighting where millions of these devices are controlled, managed and monitored remotely.

Q. How are you preparing Halonix to cope up with market challenges coming from the new technologies?

We consider 'Lighting', not as a product, but as a solution and a service also. Consumers are looking for lighting which can add value to their lives. We feel that we should not make consumers' life difficult but technology should be an enabler so that consumer can interact and interface with the products. We focus on the 'ease of use'. That is where Halonix is partnering with the companies who help us to make our products Internet of Things (IoT) enabled, simple and user-friendly. Therefore, we are collaborating with some innovative IoT enablers and trying to integrate their thoughts with our products.

We also have an excellent new product development (NPD) team with young, enthusiastic members dedicated to innovation. They often come up with fantastic ideas on what light can do and how can it add value to consumers beyond illumination.

We Indians are cost conscious and I do not see any harm in that. I feel, rather than following what developed countries have done, we should focus on our own journey. We, at Halonix, are looking from that perspective - what does an Indian consumer want? What makes their life easier? I think they are looking for convenience, ease and the products that make life a little bit better in quality but at the same time, affordable, and cost effective. Actually, that is why we at Halonix, are focusing on smart technology that is customised for Indian needs.

"The biggest application of connected lighting in India at present is Street Lighting where millions of these devices are controlled, managed and monitored remotely."

Rakesh Zutshi, Managing Director,
Halonix Technologies Limited

IN A LIGHTER VEIN

HOW I SPEND MY FREE TIME... I am an avid reader and I like to unwind myself through reading

THESE ARE A FEW OF MY FAVOURITE THINGS...

BOOKS

I like to read memoirs where I can delve deep into human psychology. The last book I read was the memoir of an ex US ambassador to Pakistan. His memoir is about his tenure in Pakistan and how the nation comes out through different situations.

CUISINE

My favourite cuisine is non-vegetarian Kashmiri delicacies like rogan-josh and Kabarga. However, while selecting a suitable restaurant, I always give priorities to the selection of my kids. They prefer Chinese and Punjabi foods.

FILMS

Usually, I prefer to watch comedy films. Besides that, I also like movies with positive note . For example, recently, I watched the movie 'Gully Boy'. It is acoming-of-age story based on the lives of street rappers in Mumbai and I am quite impressed with the movie.

HOLIDAY DESTINATION

Europe, especially Austria

MUSIC

Ghazals are my all time favourite.

SINGER

Mehdi Hassan is my favourite singer. I also like to listen to Pt. Yash Raj, Old Hindi songs from Raj Kapoor's films that applaud the freeness of the spirit

ACTOR & ACTRESS

- *Ranveer Singh*
- *Alia Bhat*

ELCOMA WELCOMES NEW MEMBERS

SL NO.	COMPANY NAME	CONTACT PERSON	DESIGNATION	LOCATION
1	**Prompt Services**	Mr. Dilip Bhaskar Joshi	CEO	Maharashtra
		Mr. Mihir Joshi	Business Development	
2	**R.K. Lighting Pvt. Ltd**	Mr. Amit Sureshkumar Khandelwal	Director	Maharashtra
3	**Aroson Plastics Pvt. Ltd**	Mr. Saheb Singh	Director	New Delhi
		Mr. Amrik Singh	Managing Director	
4	**Luminous Power Technologies Pvt. Ltd**	Mr. Vipul Sabharwal	Managing Director	Gurugram
		Mr. Naveen Saxena	Assistant Vice President	
5	**Devtech M2M Limited**	Mr. Snehal Parikh	President	Pune
		Mr. Kiran Yedmal	Business Development	
6	**Ibahn Illumination Pvt. Ltd**	Mr. Rajeev Chopra	CEO	New Delhi
		Mr. Arjun Balram Shahani	Director	
7	**Century LED Limited**	Mr. Aniruddh Kajaria	President	Kolkata
		Mr. Gopal Singh	Director	West Bengal
8	**SYSKA LED Lights Pvt.Ltd**	Mr. Rajesh Uttamchandani	Director	Pune
		Mr. Swapnil Shinde	Assistant Vice President	

Future is this

HALONIX

POWER GONE
BUT HALONIX STILL ON

INVERTER LED LIGHT

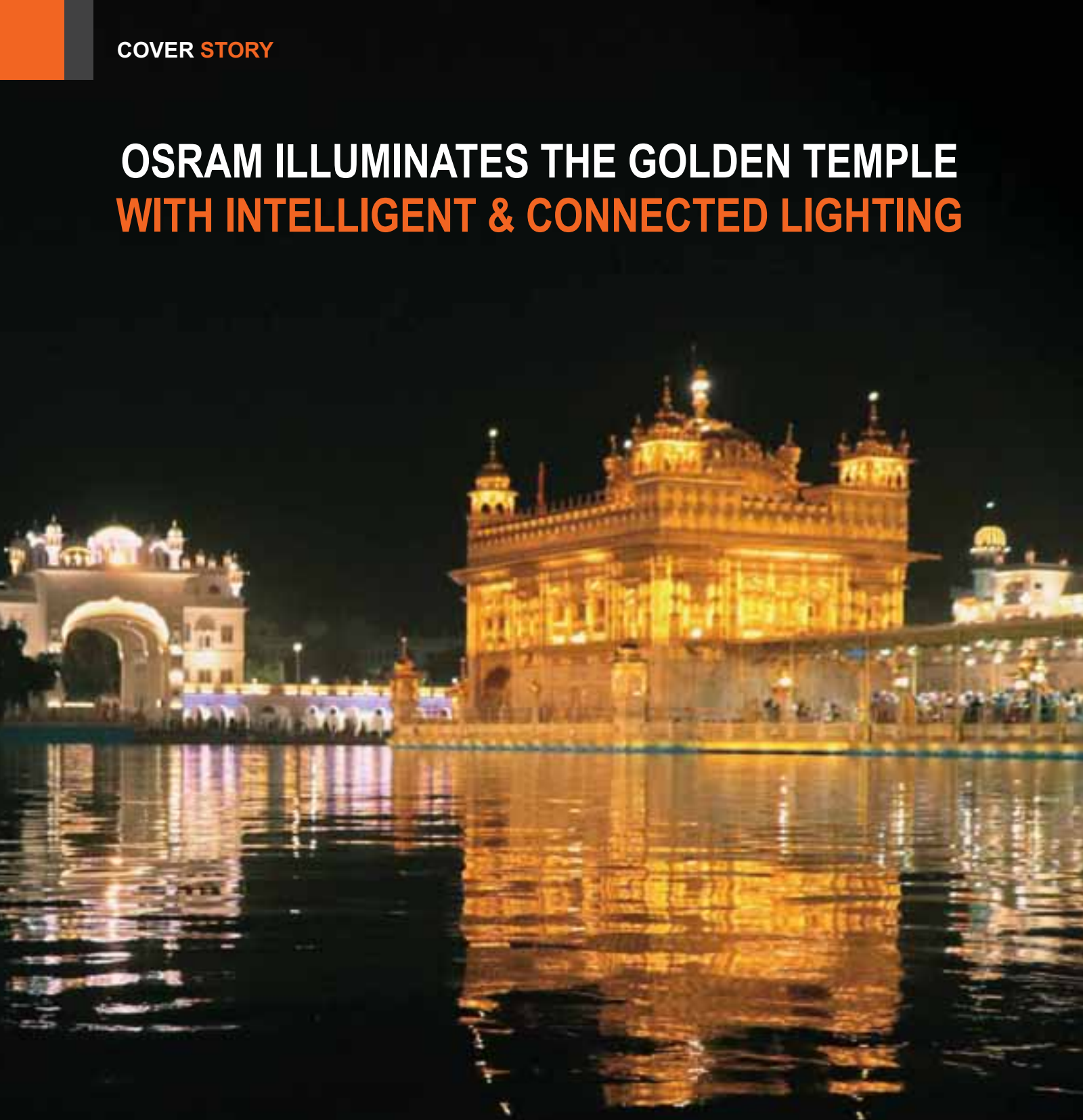
UPTO **4** HRS BACKUP

INVERTER FAN

UPTO **10** HRS BACKUP

Toll Free No.: 1800-103-6564 | Website: www.halonix.co.in

OSRAM ILLUMINATES THE GOLDEN TEMPLE WITH INTELLIGENT & CONNECTED LIGHTING



OSRAM Lighting India, illuminates one of the holiest shrines Sri Harmandir Sahib also known as Sri Darbar Sahib or The Golden Temple. The temple itself occupies a small island in the center of the tank, or pool, called the Amrita Saras ("Pool of Nectar") located in Amritsar city, Punjab, India. Sikh Gurus, conceived the idea and created a central place of worship for men and women from all walks of life and religions. Every day more than 1 lakh devotees visit The Golden Temple from all over the world to seek spiritual solace and religious fulfilment. Keeping in view the sacred fervor of The Golden Temple, OSRAM designed the lighting with a touch of spirituality and humility.

"We, at Osram, feel privileged to be associated with The Golden Temple Lighting project. To illuminate one of the holiest shrines with our Traxon dynamic LED Luminaries is a pride to be cherished forever."

Avinder Singh,
CEO & MD, OSRAM - India

PROJECT AT A GLANCE

The project was conceptualized to illuminate the shrine in synchronization with its architecture and spirituality. Around 6000 LED luminaires, mostly customized with a wide variety of CCT (ranging from 2400 to 6500K), beam angle (from 6 degree to 120 Degree and including elliptical beam), wattage (9 Watt to 330 Watt) were installed to ensure complete environment friendly lighting with zero UV and mercury. This installation has minimum spillover light to ensure least light pollution. The concept of design was to highlight the arches and different layers of the building.

To make the installation aesthetical, proper customization was done even on luminaire body (as an example, to camouflage with gold, linear fixtures at Shri Harminder Sahib was made with golden finish). From a control point of view, this project includes DMX, 0-10V dimming, phase cut dimming and on / off control system.

To bring synergy, the above said protocols were brought under a single platform and controlled through a customised software from a central control room thus enabling the creation of various desired scenes for different festivals and day to day activities as well.

This project is a perfect example of how light can symbolize the sacred feeling by transforming the entire night view and providing a dimension to it. The pilgrims gather at this place of mesmerizing beauty and sublime serenity to listen to hymns and pay obeisance to the Sri Guru Granth Sahib (The Holy Scripture) which is recited here. Special care is taken to minimize the glare and lighting levels to maintain the essence of the tranquil atmosphere of the sacred place.

The sacred monument at night hypnotizes the pilgrim and speak aloud about the core and culture of humanity. OSRAM takes pride in getting the opportunity to add lighting in Sri Darbar Sahib that transforms creative vision into an unforgettable lighting experience.

OSRAM INDIA

OSRAM, with its head office based in Munich (Germany), is a leading global high-tech lighting company with a history dating back more than 110 years. Primarily focussed on semiconductor-based technologies, OSRAM products are used in highly diverse applications ranging from virtual reality to autonomous driving and from smartphones to smart and connected lighting solutions in buildings and cities.

OSRAM is one of the premier and leading lighting technology companies in India.

Through smart connected lighting infra-structure, OSRAM's Digital business unit, enables their customers to gain access to digital solutions in a connected world. This solution covers luminaires, control, systems and applications beyond lighting.

OSRAM's Automotive business unit develops, produces and sells lamps, light modules and sensor components for automotive applications in both OEM and aftermarket segments. This includes conventional and LED-based solutions. By combining lighting and electronics expertise, OSRAM develops and market intelligent lighting solutions for automotive applications, such as intelligent matrix light for headlamps and their Opto Semiconductors offer a spectrum of infinite possibilities of high quality products in the field of illumination, visual-ization and sensor technology.

OSRAM's extensive technological know-how and passion for innovation makes them a global leader in the field of Lighting Technology.

Author: OSRAM INDIA

ADDITIONAL COLOUR QUALITY MEASURE TO BE USED WITH CRI

Application of CIE 13.3-1995 with associated CRI-based Colour Rendition Properties

The Global Lighting Association (GLA) issued a position statement on Colour Rendering Index in 2015 with, amongst other things, the request for an additional colour quality measure that can be used in conjunction with the well-established CIE general Colour Rendering Index, R_a. Sinc This additional color quality measure, to be used in conjunction with CRI has been formally endorsed by ELCOMA technical committee as well as the Governing Body. Since 2015, there have been several efforts to develop such a measure:

- The Illumination Engineering Society (IES) of North America has published IES TM-30-15 "IES Method for Evaluating Light Source Color Rendition" in 2015
- The International Commission on Illumination (CIE) has published CIE 224 "CIE 2017 Colour Fidelity Index for accurate scientific use" in 2017.
- CIE Reportership DR 1-68 "A Gamut Area Measure and Colour-shift Graphic, based on CIE 13.3-1995" was established in April 2017, with unanimous approval of the GLA membership.

"This additional color quality measure, to be used in conjunction with CRI has been formally endorsed by ELCOMA technical committee as well as the Governing Body."

CIE is the globally recognized organization for characterizing light and lighting and for publishing international reports and standards in this field. The recently published document CIE 224 includes a new colour rendering index (R_f), which is based on IES TM-30-15, but the CIE recommends this new fidelity index only for scientific (not for industrial) purposes. Consequently, R_a will continue to be used in the lighting industry, which is in line with the GLA 2015 position statement.

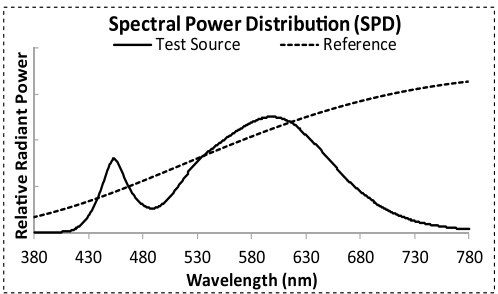
The activities of CIE Reportership DR 1-68, to supplement R_a with additional CRI-based measures, started in April 2017 and the Technical Note was expected to be published in early 2018. The members of the Reportership completed their work, but, the CIE Board of Administration felt it was inappropriate for the CIE to publish a Technical Note based on the CIE 13.3 Technical Report "Method of Measuring and Specifying Colour Rendering Properties of Light Sources", which was last revised in 1995, especially bearing in mind that CIE 224 with R_f was published in 2017. Consequently, it was decided by the CIE Board of Administration that there will be no CIE publication with a measure to supplement CRI on such short notice.

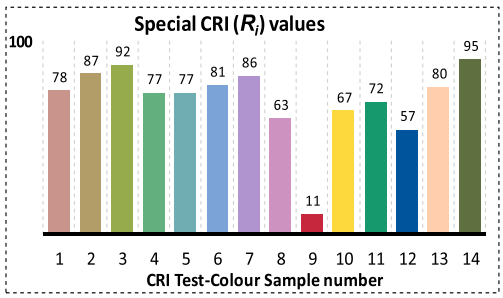
To satisfy the needs of the lighting industry, it was felt that GLA must publish the CRI-based measures defined by CIE DR 1-68. These measures are a straightforward extension of the CRI method defined in CIE 13.3 and consistent with the Japanese Industry Standard JIS Z 8726-1990, "Method of Specifying Colour Rendering Properties of Light Sources". The new measures include a colour gamut index (G_a), chroma indices (C_i), hue-angle changes (Δh_i), and a colour shift graphic, which may help explaining why

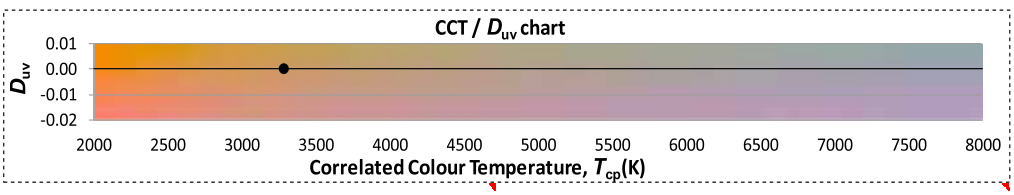
Output of GLA Calculation Tool for CIE 13.3 CRI and Associated CRI-based Colour Rendition Properties

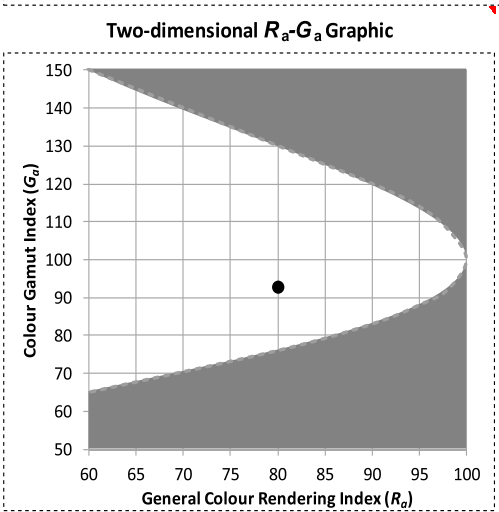
Test Source:	Example (CIE 224) LED spectrum		
Notes:	From CIE 2017 Colour Fidelity Index Calculator 1 nm - V.3(2017-07-15).xlsx		
Date / Time:	**Friday, December 7, 2018**	**12:55:53 PM**	

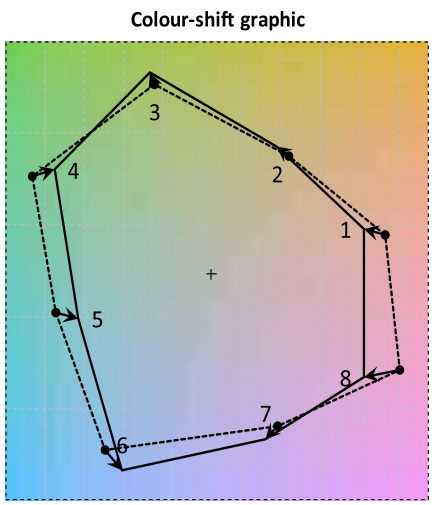
Correlated Colour Temperature (T_{cp}) in K	3288	CIE1931 chromaticity coordinate, x	0.4174
Distance to Blackbody Locus (D_{uv})	-0.0003	CIE1931 chromaticity coordinate, y	0.3957
General Colour Rendering Index (R_a)	**80**	CIE1976 chromaticity coordinate, u'	0.2415
Colour Gamut Index (G_a)	**93**	CIE1976 chromaticity coordinate, v'	0.5151

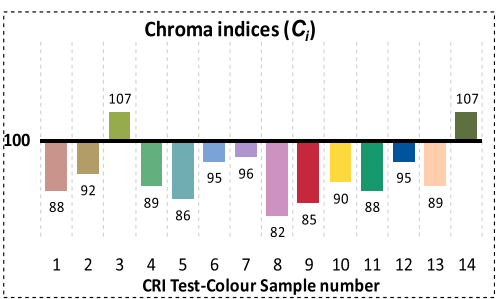


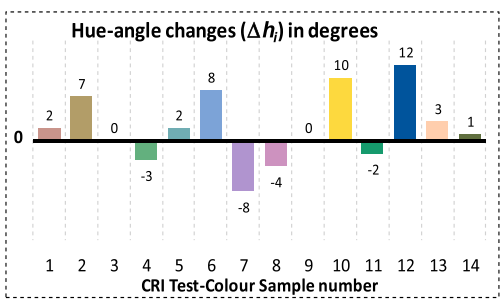












object colours can still appear differently when illuminated under light sources with the same R_a value. China is in the process of including these measures in their CRI-update document (GB/T 5702)

To ensure global availability and dissemination of the measures, GLA has published these on their website alongside with an accompanying Excel tool to compute the values such that all manufacturers and end-users have free access and can freely use them upon their desire. This enables a unified and more complete characterization of the colour rendering properties of white light sources.

Author: Compiled by the Illumination Editorial Board with inputs received from Jan Denneman, Founder CarpeLucem and Honorary Ambassador of the Global Lighting Association

GLOBAL LIGHTING ASSOCIATION

PILOT PROGRAM FOR SAFE DISPOSAL OF CFL

ELCOMA, with support from Residential Welfare Associations (RWAs) in New Delhi is enabling safe disposal of CFL bulbs and fluorescent tubes

Ministry of Environment, Forest and Climate Change (MOEF) has recently issued the E-waste Management published in the Gazette of India. Similar guidelines have also been issued by Central Pollution Control Board (CPCB) which specify rules regarding the safe disposal of Compact Fluorescent Lamps (CFLs) and Fluorescent Tube Lights (FTLs) and also specify the amount of mercury allowed to be used for manufacture of such lamps.

CFL and Fluorescent Tube Lights contain a very small quantity of Mercury which is one of the "Hazardous Elements" notified as per United Nations Environment Program (UNEP). Indian CFLs contain Mercury in a "Solid Pellet" form of less than 5 mg, which does not spill or evaporate. As per the E-Waste rules, used CFLs and Florescent Tube Lights (FTLs) are required to be safely disposed at the end of their life. This mercury, if not disposed off in a safe manner could reach into the soil and water and contaminate it.

ELCOMA has started a pilot project with the support of Resident Welfare Associations and garbage collection agencies. These can be the best source for collection of fused, unused or non-operational CFLs and FTLs. Keeping this in mind, the manufacturers of CFLs and FTLs have jointly undertaken a Pilot Project for collection and disposal of CFLs and FTLs through RWAs supported by ELCOMA.

ELCOMA has mobilized a team to visit and sign up 100 Resident Welfare Associations (RWAs) in Delhi/NCR where bags for safe collection of fused/used CFLs and FTLs are installed. ELCOMA has created awareness among the residents of the colony as well as the garbage collectors in that location regarding the safe collection, storage and disposal of CFLs and FTLs. Signify Innovations India Limited (formerly known as Philips Lighting India Limited) and Surya Roshni Limited provided invaluable support to this initiative by supplying CFL collection bags and T-Shirts respectively for the program.

Each RWA that signs up for the pilot program, receives the following support/facilities from ELCOMA

- A box is located at the association office (or any other suitable location identified by the RWA) where the residents can deposit their used CFLs and FTLs
- A circular is printed on RWA letterhead and circulated to all residents of the colony to create awareness of the CFL and FTL safe disposal
- The lamps that are deposited by the residents are picked up by authorized collection personnel/agent/agency as per a pre-determined frequency. The RWA can also call for collection when the collection box is full and within 48 hrs the collection agency will collect the CFLs/FTLs.
- ELCOMA will also ensure wider awareness among larger number of residents about depositing the fused Lamps at their RWA office by doing publicity through insertions in newspapers.
- All the Fused CFL & Fluorescent Lamps collected will be safely disposed through Treatment, Storage, and Disposal Facilities (TSDFs) by ELCOMA.

"Although CFLs and FTLs have reached the end of life, as a responsible association of manufacturers, ELCOMA has started the pilot for collection of fused/used lamps and their safe disposal in Delhi and if successful shall initiate such projects in other states also."

Shyam Sujan,
Secretary General, ELCOMA

ELCOMA has mobilized a team to visit and sign up 100 Resident Welfare Associations (RWAs) in Delhi/NCR where bags for safe collection of fused/used CFLs and FTLs are installed.

ELCOMA HAS TAKEN SEVERAL INITIATIVES ON THE SUBJECT OF MINIMIZING THE IMPACT OF CFLs AND FTLs

- ELCOMA supported the recommendations of the special Task force (Khwaja 2010) constituted for the purpose where it was recommended to create a corpus of funds for safe disposal of CFLs and FTLs by collecting/adding a Cess on the sale of such products in the market. But the Ministry of Finance at that time did not grant an approval to this recommendation.
- Indian Manufacturers of these products, who are ELCOMA members, were earlier using liquid mercury but after 2011, have introduced changes in technology to incorporate mercury in solid pellet form in the lamps. The advantage of this method is that the Mercury is easy to control, collect and dispose and does not evaporate or spill.
- The quantity of Mercury used in the products has also been significantly reduced to below 3 milligrams, which is well within the prescribed limits set by the MOEF and CPCB.
- ELCOMA has always been reiterating that the residual value of these lamps is almost zero and cannot be incentivized for collection due to low residual cost.
- CFL and FTL being glass items and fragile in nature, it is always difficult to ask the end users to deposit the end of life product to distributors or dealers.
- ELCOMA recommended that a report by The Energy Research Institute (TERI) for safe disposal which was approved by MoEF should be followed although it was never implemented.
- CFL and FTL are at end of life cycle and almost 80% of manufacturers have stopped manufacturing CFL and FTLs

SAFE DISPOSAL
FOR CFLs AND FLUORESCENT TUBES

As per Ministry of Environment, Forests and Climate Change (MoEFCC), E-Waste Rules and CPCB Guidelines, we are required to safely dispose all used CFLs and Fluorescent Lamps.

Please Handover your Fused / Used Lamps to your RWA

We have placed collection boxes in various RWA offices. We will collect all lamps deposited in this box and dispose them scientifically and safely.

CFL and Fluorescent Lamps contain a small quantity of Mercury, which is one of the 8 hazardous elements declared by UNEP. Though Indian CFLs contain less than 5mg of Mercury and that too in solid pellet form that does not spill or evaporate, the safe disposal of these lamps is mandatory.

List of RWAs where ELCOMA has installed collection boxes :

Alaknanda
- BEWCGHS, KaveriApts
- Mandakini Enclaves
- Ganga Apartment
- Tara Apartments
- Gangotri Enclave
- Aravali Apartments
- Rishi Apartments
- Kaveri Apartments
- Ganga Apartments

Chittaranjan Park
- RWA Pocket-52
- RWA M Block
- RWA N Block
- RWA G Block
- RWA P Block
- RWA D Block
- RWA F Block
- RWA Block-A

Lajpat Nagar
- Neighbourhood Residents Ass.
- RWA Block-I
- RWA Block-B
- RWA Block-A

Malviya Nagar
- B-Block, Shivalik Apartments
- RWA Navijiwan Vihar
- Pragati Park RWA, H-Block
- RWA Panscheel Enclave
- RWA Sainik Farm

Safdarjung Enclave
- B-3 Block, Library
- Efforts Group RWA
- SEWA, B-7 Block
- RWA B-1, Block
- RWA A-2 Block

Sarita Vihar /Jasola
- RWA Sector-8
- SFS Flats RWA Sector-7
- RWA Pocket-C
- RWA Pocket-H
- RWA Pocket-K
- RWA Pocket-B

South Delhi
- RWA Defence Colony
- RWA E-Block East of Kailash
- E Block, GK III
- NRI Complex, GK IV
- RWA R-Block HausKhas
- B-1 & G Block RWA HausKhas
- Nerhu Apartments, Kalkaji
- Qutab View Apartments, Katwaria Sarai
- Radha Apartment, Krishna Nagar

Hauz Khas
- B-1 & G Block, RWA
- R-Block, Residents Association,

Rest of Delhi
- Ridge View Association, New Rajinder Nagar
- Mitradweep Apartment Patparganj
- Prashat Apartments Patparganjj

elcoma **ELCOMA**

सुरक्षा का समाधान

सीएफएल और फ्लोरोसेंट ट्यूबों के लिए

पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय (MoEFCC), ई-वेस्ट नियम और सीपीसीबी दिशानिर्देशों के अनुसार, हमें सभी इस्तेमाल किए गए सीएफएल और फ्लोरोसेंट लैंप को सुरक्षित ढंग से निपटाने की आवश्यकता है।

कृपया
अपने फ्यूज और इस्तेमाल किये गये बल्ब और ट्यूब लाइट को RWA के दफ्तर में जमा कराएं

हमने विभिन्न RWA कार्यालयों में बक्से रखे हैं। हम बॉक्स में जमा सभी बल्बों को इकट्ठा करेंगे और उन्हें वैज्ञानिक और सुरक्षित रूप से निपटायेंगे।

सीएफएल और फ्लोरोसेंट लैंप में पारे की थोड़ी मात्रा होती है, जो यूएनईपी द्वारा घोषित 8 खतरनाक तत्वों में से एक है। हालाकि, भारतीय सीएफएल में 5mg से कम पारा होता है और वह भी ठोस गोली के रूप में जो फैलता या क्षपित नहीं होता है, इन लैंपों का सुरक्षित निपटान अनिवार्य है।

SUPPORTING ORGANIZATIONS

BAJAJ Bajaj Electricals Ltd. · PHILIPS · SURYA · HALONIX · wipro · HAVELLS · EVEREADY GIVE ME RED · LEDVANCE · HPL · Crompton · ANCHOR by Panasonic · orient electric switch to smart

ELCOMA

इस पायलट प्रोजेक्ट का क्रियान्वयन इलेक्ट्रिक लैंप एंड कंपोनेंट मैन्युफैक्चरर्स एसोसिएशन ऑफ इंडिया द्वारा किया जा रहा है जो कि भारत में प्रकाश निर्माताओं का एक सर्वोच्च निकाय है

Message to RWA

In case we have not been able to reach you, please contact Mr. Vivek Kumar
Mob. : +91 7091749296 / E-mail: info@elcomaindia.com / www.elcomaindia.com
for immediate supply of Box and collection of Fused Lamps

PICTURE GALLERY

Pilot program for safe disposal of CFL

T-shirts supplied by Surya Roshni are distributed to workers at RWAs

Happy to safe dispose Tube Lights and CFL in one of the RWAs

Tube Lights being deposited in the box at an RWAs Centre

The T-shirts carry massage of support to CFL safe disposal

Banners at display

ISA INVITES APPLICATIONS ON 2019 GLOBAL SSL SHOWCASE "TOP100" AWARDS

Like each year, the Global SSL Showcase Top100 Awards are inviting applications for the best SSL application projects in India

The TOP100 award was successfully launched in 2012 and till date 73 extraordinary and influential SSL showcases worldwide have been selected as the winners.

TOP100 aims to recommend and manifest the best SSL application projects worldwide by demonstrating the SSL R&D achievements and the application of technology innovation in SSL technology. Top 100 awards the best design, best installation and most reliable products to promote the characteristics and advantages of SSL. These awards help people acquire a better understanding and experience of SSL and help to increase the influence of SSL and speeds up the promotion and application of SSL far and wide around the world.

Companies/Manufacturers that submit their applications for TOP100, present their exquisite designs, or reliable products, or high quality installations which helps them improve their global visibility and influence as well as add credibility for the development of business opportunities and opens up broader markets.

JURY EVALUATION

Secretariat of ISA collects and submits applications to the jury panel, which consists of several highly experienced experts and professionals from around the world that specialize in SSL design, engineering, technology, production and SSL R&D. The jury panel will judge the applications according to the Terms of Reference and Rules of Procedure of this award.

RELEASE AND PUBLICITY

The winners of the award will be publicized and promoted by ISA in a printed book and electronic version to the global SSL industry, relevant national government agencies, R&D organizations, application departments, procurement groups, and international organizations, etc.

Applications will be accepted only from the following categories and one project can only be categorized as one type.

- Agriculture Lighting
- Health Lighting (lighting projects only in hospitals, schools, offices, etc)
- Smart Lighting
  a. Indoor Lighting
  b. Outdoor Lighting

Manufacturers can submit their applications before 30 May 2019 at ELCOMA office and should not miss the opportunity of demonstrating their projects to the world. ELCOMA will have a preliminary screening of the applications and then submit to ISA. Those projects that fit the entry criteria will be given to the Jury Panel comprised of highly experienced experts for their evaluation. The successful applications (winners) will be announced and presented to the public at ISA General Assembly in October or November, 2019 in China.

The application form can be provided on request by Ms. Nikita Gupta who can be contacted at 011-41556644 or nikita@elcomaindia.com. Completed applications must be submitted along with high resolution photographs of the project.

REQUIREMENTS FOR SUBMISSION OF APPLICATION FOR TOP 100

- Any organization in SSL industry worldwide is eligible to apply
- The applied project/sshould have been completed and accepted on or before May 10, 2019

LVDC: THE FUTURE OF POWER

As per data available, 1 billion people around the world do not have access to electricity. Low voltage direct current (LVDC) systems, along with solar panels and LED lighting, can help to solve the power shortage that the world is facing. In India, many homes are equipped with solar panels and this has led to DC being generated in smaller segments.

BRINGING ELECTRICITY TO PEOPLE

In the last decade or so, the government has been debating about how to bring electricity to the people of India. About 15 years ago the government decided to build more power plants to address this issue. Government mooted a model with big power generation plants, powered by coal or using hydro-electricity and extensive networks of 2000-3000 km-long power lines to transport the electricity.

Several coal-fired and hydropower plants were built, but then it was realized that power lines had to be installed to transmit power across from the generating location to the end consumers. India is a big country with 32 states and to achieve this requires permission from each of those states from which the power lines have to travel. The decision making system and the environmental policies of each state may be different and so may the regulations, which of course leads to inordinate delays. So even though a power plant may be built and operational, it may take upto five years to install transmission lines to transmit the power being generated from that plant.

The second issue was that subsequently this power also has to be transformed down in stages: from 650 kV to 440 kV, then to 66 kV, to 11 kV, down again to 440 V and eventually to 220 V to enable a bulb to be lit. It typically would take about 20 years to build such a network and bring electricity to villages. And if there is any incident along the line, the whole power supply system (or grid) goes down, which happened few years back when the entire Northern Power Grid of India tripped leaving millions without power.

By 2010, although many power plants had been built, it was recognized that something more radical had to be done: we could not wait 15-20 years to bring electricity to people. This is already a political issue, but if it cannot be affected rapidly, it becomes a social issue.

SOLAR IS THE ANSWER

There is growing awareness of environmental issues and of the need to bring electricity to people rapidly. At the same time the price of solar panels has also reduced significantly and the Indian government embarked on a big solar power mission in 2010. The plan was to produce 22 GW of solar electricity by 2022.

The Narendra Modi government, pledged to increase this to 100 GW by 2019. As a result, India is now one of the hottest markets in the world for renewables. The government has embarked on a new policy of incentives and liberalizing investments to provide 200 GW of solar power by 2024 which has become the

driving force for power reform in India. Soon India would be transformed from a severely power deficit nation to a nation that exports power.

DC IS THE ANSWER

Most of the world's devices are run by electronics. They all work on direct current (DC) supply. This includes LED (light emitting diode) lighting, LED Filament Lamps, computers and electronic devices. Laptops and mobiles come equipped with adapters and convert the alternating current (AC) supply into a suitable DC voltage. Television sets are equipped with SMPS inside. The adapters take in an input voltage that varies between 110V – 240V AC, and produce a DC voltage ranging from 1V – 36V, and the electronic devices use this DC voltage. Input voltages have been standardised to 100V – 240V by the International Electrotechnical Commission (IEC), but output voltages have not been standardised.

Since all electronic devices ultimately use a DC supply, the current power system could be modified to give a DC supply directly to these devices, instead of providing an AC supply that needs to be transformed to DC before it can be utilised. This would mean that only DC-DC step-down and step-up transformers would be used, instead of AC-DC transformers. This would save a lot of energy, because the existing AC-DC conversion method inherently leads to energy losses. Even in the best cases, the efficiency of AC-DC conversion is 83-85 percent, which means that there is a 15-17 percent loss of energy when AC is converted to DC. This energy is lost in the form of heat, which is why laptop and mobile adapters start heating up after a while.

Solar power generation is localized : no long transmission lines are needed. And not every solar power plant needs to be at a gigawatt-scale. You can have smaller scale and can enable small power generation units of MW capacities at buildings, so rooftop solar plants are being promoted in a big way.

There is now a global realization that, almost without being aware of it, we've been using DC but generating in AC. Now we need to put a system around it. This has been the main reason why we see this widespread renewed interest in DC.

NEED FOR DIRECT CURRENT AND THE FUTURE OF LVDC

Around 85 per cent of electricity that is generated in the world is ultimately used by electronic devices, which need a DC supply. Consider the example of air conditioners - these utilise inverters with variable frequency drivers to convert AC to DC. Thus, there is a need for utilities to supply DC itself, instead of AC, since the latter needs to be transformed to DC first, before being used by electronic devices. This is where LVDC (low voltage direct current) becomes relevant.

LVDC will have a very big role to play in the future in urban as well as rural locations. All technology trends such as IoT (Internet of Things), smart buildings, smart homes, smart cities, active assisted living and solar photovoltaics will start converging in the future. Each of these will be linked to LVDC, which will play an important role in all these sectors.

Currently, the standardisation process for LVDC has begun in India.

VOLTAGES AS A SYSTEM AND STANDARDIZING PLUGS AND SOCKETS

By definition LVDC means up to 1500V and LVAC is up to 1000V. The moment we are below 1500V we're looking at voltages as a system. It's pretty obvious that a desk telephone works best at a certain voltage, a laptop or a desktop computer at a certain voltage and strip lights or a video projector at different voltages. The reason is that the power to drive that equipment efficiently is different. Even if all these are DC applications, ideally they may work at

Electricity for the 21st Century : Electricity for all

Power generation and distribution in direct current can bring electricity to the hundreds of millions of people denied access to the benefits of modern life.

Take a look around you. Is there anything we can do without electricity? Be it lighting, education, healthcare, productive work of almost any kind - everything requires electricity. And yet, today, there are around 1.1 billion people worldwide without any electricity access at all. Not providing electricity is the same as denying the fundamental right to be part of today's opportunities in an increasingly connected world. Direct current (DC) electricity could be the solution.

different voltages.

The next challenge is to address the installation, protection and distribution issues. This means that the standardization of plugs and sockets is also essential.

Some US IT hardware manufacturers have started building DC sockets in computer systems. They have the same physical dimensions as AC sockets, but are fail-safe as it is impossible to connect an AC cable to them. If you want to use DC, you can use a DC-DC converter since there is a need for some kind of conversion within the system. But the difference is that there is no loss of energy with DC-DC conversion, unlike AC-DC conversion. So when you have DC-DC conversion the only thing you need is a DC plug to get going. Work is already under way to define a system for DC plugs and sockets.

In a decade or so, we believe that the question of AC/DC will be fully settled. It is expected that DC meters, DC cables running through buildings and DC-DC converters per room or per device will be provided.

All this means that as things evolve in the future there will be standards both for new-build and for retrofitting buildings to DC.

DIFFERENT NEEDS, SAME EXCITEMENT FOR LVDC

The needs of countries are completely different.

In India, for instance, there is a need for electricity everywhere, but the transmission infrastructure doesn't reach all places.

In developed economies such as Germany, Switzerland, countries throughout Europe and many other places, the infrastructure exists and there's electricity everywhere. So why does LVDC arouse excitement in all countries?

In developing countries where there is not enough electricity for everyone, we're talking about electricity access. In developed economies, people are getting more conscious about their environment, green energy, energy efficiency and reducing carbon footprint. These countries are 'greening' their technologies.

All of these, plus trends that see a global growing demand for LEDs, solar PV and associated storage, come together and require a comprehensive DC system.

The IEC is working with associations across the world on LVDC and is trying to create global standards for DC plugs and sockets.

So the question is not: “do we want AC or DC?” but "when are we getting DC?"

Author: Mr. Vimal Mahendru
IEC Ambassador,
Chair, Systems Committee, LVDC

HIGHLY EFFICIENT DC-DC CONVERTERS

DC-DC conversions have become more efficient today. The latest DC-DC converters offer an efficiency of about 98 per cent. This makes them very efficient compared to AC-DC converters. In India, lighting systems consume about 18 per cent of the energy produced. If LED lighting is used, this could come down to about 13 per cent in the future. In addition to this, if DC-DC converters are used, then around 15 per cent additional energy can be saved in the long run.

IEC ELCOMA LVDC CONFERENCE

Shape of Future Products and Applications

VENUE
New Delhi

DATE
August 9, 2019

CONFERENCE TOPICS

- Electricity access in India and future plans
- New LVDC Regulations and Legislations
- LVDC Solar Street Lights
- Lighting Products and Applications on LVDC
- Product technology Solutions
- Product modifications with LVDC circuits
- New Standards for LVDC supply and Lighting Products
- Solar Power Generation...

Expert speakers at IEC ELCOMA LVDC Conference

Mr. Harry Stokman : member of the IEC Systems Committee LVDC and Chair of Adhoc Group 1. He is an entrepreneur based in the Netherlands and also an active LVDC proponent having executed multiple projects in direct current.

Dr. R. Ramarathnam: Dr. Ramarathnam is an entrepreneur based in Chennai and has dedicated his life to developing DC appliances which are highly energy efficient. His work and products have won many global awards for being 'green', energy efficient and enabling low cost electrification.

Mr. Cristiano Masini : member of the IEC Systems Committee LVDC and also Secretary of IEC TC23s. Cristiano is a recognized expert on LVDC technologies and has deep experience and knowledge of devices like switches, sockets, circuit breakers etc.

Mr. Vimal Mahendru : IEC Ambassador, Chair, Systems Committee, LVDC

and many more...

The IEC is driving the development of LVDC, making this technology safe and broadly accessible. Holding this conference in India will provide a real understanding of electricity access needs to manufacturers, experts and stakeholders.

There is no doubt that around the world, developing countries are seeking to rapidly scale-up sustainable energy investments. This shift to sustainable energy is driven by a number of considerations, top most being the need to meet the fast growing energy demand. This becomes the driving force for standardization of Low Voltage Direct Current (LVDC).

The objectives of this conference are congruent with the United Nations Frame work on Sustainable Development Goals, especially Goal 7, which addresses the issue, "Ensure access to affordable, reliable, sustainable and modern energy for all".

The LVDC conference at one level will be a thought leadership platform to effectively engage with policymakers and regulators. At another level, it will facilitate technology application and demonstration projects to gain techno-economic information needed to evolve LVDC standards and catalyze the technology's commercialization.

WHO SHOULD ATTEND?

Stakeholders engaged or interested in electricity access and low voltage direct current (LVDC); Manufacturers of electronic products, technical experts, government representatives, funding agencies, investors, insurance companies, solar and renewable, power utilities, equipment manufacturers and NGOs.

WHY YOU NEED TO ATTEND?

LVDC is an important tool to expand real, reliable access to electricity. The future power supply system will change to 50 volt DC. As a result new and renewable energy will take the front stage when it comes to conversion of entire power supply system. Hence there is an urgent need to prepare for new product and manufacturing technology incorporating LVDC. For example, street lights will not require drivers, domestic Electronic and Lighting products will not require transformers and the best part is that the future products will be very safe and economical to run. This is your opportunity to provide inputs as well as understand your local needs and requirements; hear about economic opportunities linked to LVDC; contribute to the development of key performance and risk assessment indicators that will allow regulators and systems administrators to benchmark LVDC solutions from different vendors and fund and insure LVDC infrastructure.

WHAT WILL YOU LEARN?

You will learn about what is driving the development of LVDC and what it will take to safely and broadly roll-out this technology; the important role LVDC will play in universal energy access and economic development; use-cases from other countries. You will learn about now to start preparing for manufacturing of future components, end products, after sals service training and the progressive transformation from High Voltage to Low Volage DC power supply. Those who will miss out will have to depend on learning later from others who have already taken lead in change.

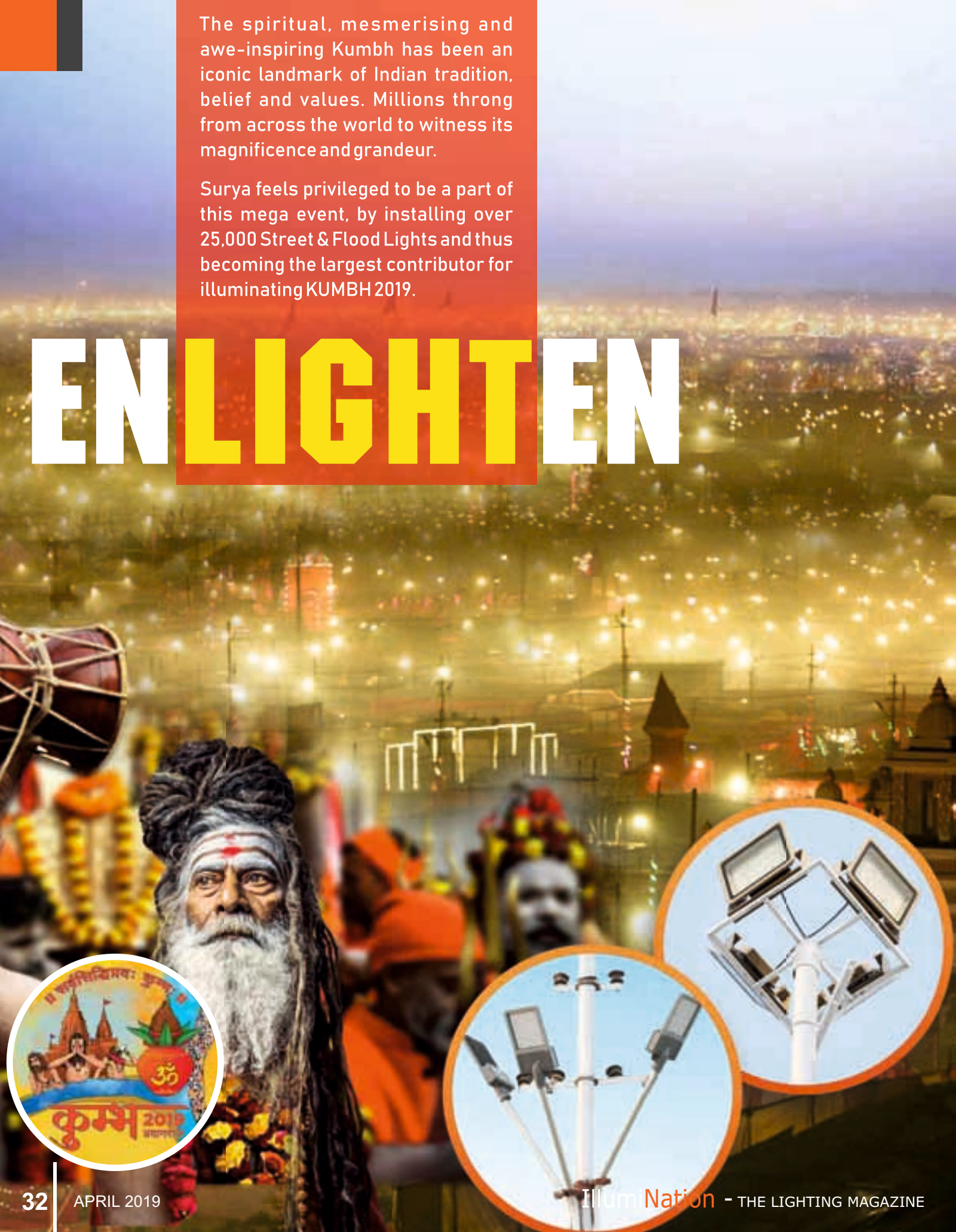
INTERESTED ?

Just call Deepak Kumar at ELCOMA Secretariat at +91-11-41556644 or email - deepakkumar@elcomaindia.com

The spiritual, mesmerising and awe-inspiring Kumbh has been an iconic landmark of Indian tradition, belief and values. Millions throng from across the world to witness its magnificence and grandeur.

Surya feels privileged to be a part of this mega event, by installing over 25,000 Street & Flood Lights and thus becoming the largest contributor for illuminating KUMBH 2019.

ENLIGHTEN



ILLUMINATING THE KUMBH MELA OF 2019

Surya's street lighting and flood lighting systems light up the world's largest religious gathering

Kumbh Mela, the world's largest religious gathering has a deep spiritual relevance for Hindus. It has been called the largest gathering of pilgrims as crores of devotees come from all over the world to bathe in the confluence of the Ganga, the Yamuna and the mythical Saraswati rivers at Prayagraj.

As per government estimates, over 20 crore devotees visited during the Ardh Kumbh held between 5th January and 4th March 2019 at Prayagraj. The city administration made large scale arrangements to effectively manage the crores of pilgrims, including establishing a temporary city of 4,200 premium tents with public accommodation and a capacity of 20,000 beds as well as several convention halls. Sanitation facilities included 1,22,000 toilets, 20,000 dustbins, 15,000 sanitation workers, 40 Compactors and 120 Tippers for waste disposal and 2,000+ Ganga Praharis / Swacchagrahis engaged as foot soldiers to keep the areas clean. Over 500 shuttle buses and thousands of CNG auto-rickshaws were pressed into service to ferry the pilgrims and there was parking for over 5 lakh vehicles. The traffic over the 300km mela area was co-ordinated carefully by integrating with Google Maps, all of which was overseen by police personnel in 150+ police stations, police out posts and Fire fighting centers using 1,000+ cameras. The administration provided drinking water through 200 water ATMs, 150 water tankers and there was also a modern technology equipped Integrated Command and Control Center for managing the security of visitors.

The mela area was lit by more than 40,700 LED lights which included over 25,000 high power Surya LED Street lights and flood lights that were installed in the Tent City, the mela area and all the roads leading up to it.

"We feel privileged to be associated with this mega event where we installed over 25,000 high power street lights and flood lights at this largest religious gathering. We understood the requirements and carefully designed and delivered the highest quality of street light and flood light products meeting all the specifications for this prestigious event."

Raju Bista
Managing Director , Surya Roshni Ltd.

"Surya's lighting installations for the Kumbh Mela 2019 helped the government save energy, reduce waste and cut costs. In fact, we don't just sell lights, but with our offerings, we improve the world around us. This is the reason why, Surya LED with its unmatched design, versatile size and wide range of product applications is the most preferred choice of households, industries and corporates."

Raju Bista
Managing Director , Surya Roshni Ltd.

LIGHTING DESIGNING FOR KUMBH MELA INSTALLATIONS

The LED street lights and flood lights luminaires supplied by Surya Roshni for Kumbh Mela were specially designed to provide high illumination levels and high efficacies ensuring high energy savings and long life.

LED fixtures were fitted as per specific site requirements. The street light installations with different wattages and suitable optics were designed specially for wider and narrower roads, resulting in a better light distribution. They were made from high pressure Die-Cast Aluminium ensuring high thermal heat dissipation from the high-power LEDs leading to higher energy saving, product reliability and longer life.

Surya claims that every luminaire supplied was made with the best quality SMD High Power LEDs which were coupled with high efficiency street light lens made from high temperature engineering plastics for best results.

Surya used their in-house developed LED light drivers which offer the best in class specifications that, besides having a large operating voltage range, comply with all the safety and performance requirements of national and international standards.

These luminaires were installed with two different types of beam angles for lighting up the entire mela and the flood lights were specially designed and used with high masts to cover larger areas; different optics were used which could illuminate with good light levels at longer distances. These flood lights have a long life of 50,000 hours and operate on electrical systems ranging from 140 to 270 Volts and deliver high efficacy.

SURYA ROSHNI LIMITED

Surya has been one of the leading brands of lighting in India and has been offering LED and Conventional Lighting for domestic use and commercial projects. Surya's Technology and Innovation Centre (STIC) at Noida is one of the most advanced, state-of-the-art lighting laboratory with a specific focus on the development of LED luminaires and is equipped with the most advanced photometric equipment. Surya claims that their luminaires' line is driven by a relentless commitment to performance, superior value and are designed, assembled, and manufactured in house, at their ultra-modern Kashipur (Uttarakhand) and Malanpur (Gwalior) plants. Their manufacturing facilities and R&D facilities are ISO:9002 certified and NABL accredited. Surya has also completed a number of turnkey, large scale LED lighting projects including installation of High Power LED Flood Lights at Kandla Port, IOCL's refinery at Panipat, Kolkata Airport Terminal, Varanasi Bypass and lighting up India's longest Rail-Road Bridge, the 4.94 Km 'Bogibeel' in Assam.

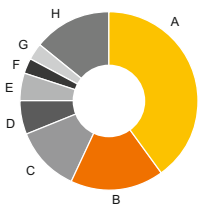
Author: SURYA ROSHNI LIMITED

light INDIA POST SHOW REPORT 2018

VISITOR OVERVIEW

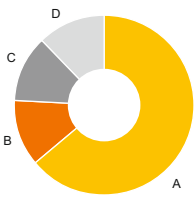
9,479 visitors

Regional breakdown of visitors*



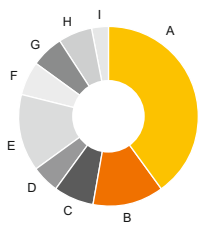
A 40% Delhi
B 17% Uttar Pradesh
C 12% Haryana
D 6% Maharashtra
E 5% West
F 3% North
G 3% South
H 14% Others, including other countries

Trade visitors – Decision makers



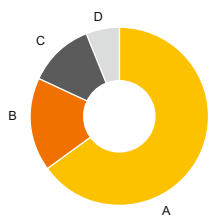
A 64% Decision makers
B 12% Recommend Purchase
C 12% Evaluate proposals for Purchase
D 12% Not related with purchase

Trade visitors by business sectors



A 40% Dealers & distributors
B 13% Lighting designers & engineers
C 7% Architects
D 5% Interior designers
E 14% Corporates, Construction companies, Builders and land developers & Real estate companies
F 6% Automobile & Hotel industry
G 6% PWD, CPWD, Municipalities from the ministry of railways
H 6% Industry associations, Trade delegations & ESCOS
I 3% Rural & urban development & Delegates from trade commission and foreign missions

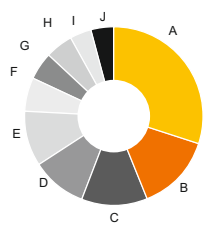
Visitor's main area of interest in Building and Home automation



A 65% Building automation systems and products
B 17% Smart home and community management systems
C 12% Building efficiency and energy management systems and products
D 6% Generic cabling and data centre systems and products

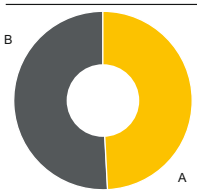
Visitors from **22 countries**

Visitor's main area of interest in Lighting Technology



A 30% Technical lighting
B 14% LED technology
C 12% Outdoor lighting
D 10% Decorative lighting
E 10% Commercial lighting
F 6% OLED
G 5% Light control, management and measurement systems
H 5% Display technology & application
I 4% Light production and measurement equipment
J 4% Accessories and electronic components

Breakdown of Exhibitor Participation



A 49.3% Indian
B 50.7% International

EXHIBITOR OVERVIEW

193 exhibitors

Countries by Exhibitors

	Countries	Exhibitors
1.	India	95
2.	China	86
3.	Hong Kong	10
4.	Korea	1
5.	UAE	1

50 YEARS OF ELCOMA IN INDIA

On 29th June, 1970, the electric lamps and components manufacturers in India founded "Electric Lamp and Component Manufacturers Association of India" (ELCOMA), representing the entire lighting industry.

The main purpose that the founding members had in mind was to establish liaison with government bodies and to support each other in matters connected with the lighting industry.

The prominent founding members were

- Philips India Ltd
- Mysore Lamps Ltd
- Bengal Lamps Ltd
- ELMI, Hind Lamps Ltd
- Toshiba Anand Ltd
- Metal Lamp Caps Ltd
- Auto Lamps Ltd
- Sylvania and Laxman Ltd, etc

In the early years, ELCOMA successfully drew attention of the government to the difficulties faced by the members and highlighted developments in new light sources and energy saving solutions to the customers.

During 80's and 90's extensive development and introduction of various types of energy saving lamps offered wide range of choice to the customer and offered indigenously manufactured lamps for all type of applications, thereby saving precious foreign exchange when the country needed it most.

ELCOMA can be proud of the fact that in spite of inflation, energy price increases and other price rises, the price of lighting products have become more cost efficient.

With the success achieved by the Association, new entrants to the lighting industry from organized as well as small sector became members and took active interest in the growth and development of the lighting industry.

Upon completion of 50 successful years of ELCOMA in India, it has been decided to celebrate this golden year by organizing several events in the year 2020.

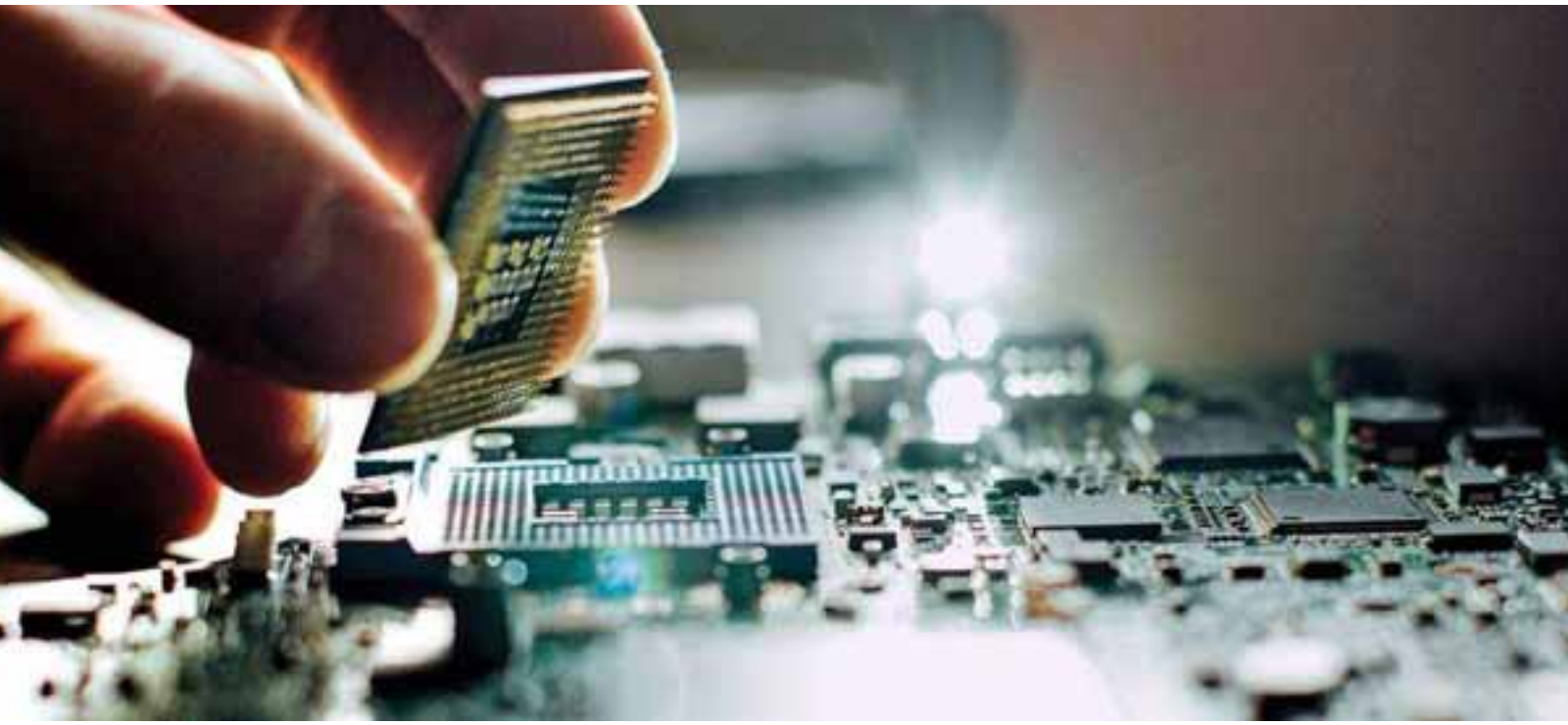
A logo has been created specially for the occasion and will be part of every event and communication.

It has been decided to have following special events and features as part of this celebration.

- A full day event which will include a conference "50 years of ELCOMA" where senior members would be invited to speak and present their experience with ELCOMA over the years. There will be a gala dinner with a special musical show. A senior government official of ministrer or secretary level will be invited to preside at the event.
- The ELCOMA magazine "IllumiNation" will cover stories by senior members in each issue with articles, episodes and pictures.
- The main theme of Light India Exhibition in 2020 will be "50 years of ELCOMA in India". A Wall of Fame will be created to cover photographs of all the past presidents, vice presidents and other captains and office bearers.
- Special medal commemorating 50 years will be released and would be given to all members and indusrty stake holders from government, senior architects and ELCOMA's friends and contacts from other countries.
- A commemorative video will also be prepared and will cover events and interviews with eminent members.

NATIONAL ELECTRONICS POLICY 2019 TO BOOST LED LIGHTING MANUFACTURING

Government of India aims to achieve $400-b turnover for local electronics manufacturing by 2025. The National Electronics Policy (NEP) 2019 provides incentives to promote domestic manufacturing of different verticals of electronics sector including LED lighting



NEP 2019 comes with a bunch of new incentive schemes including an 'Interest Subvention Scheme' (ISS), a 'Credit Guarantee Fund Scheme' and a new 'Electronics Manufacturing Cluster' (EMC 2.0) scheme.

CREDIT GUARANTEE, INTEREST SUBSIDY ON LOANS

The government is considering credit guarantee for term loans of up to Rs 100 crore as well as an interest subsidy on loans of up to Rs 1,000 crore for electronics system design and manufacturing (ESDM) companies under the new policy.

According to official sources, the Ministry of Electronics and IT has proposed "credit guarantee fund" (CGF) scheme and "interest subvention scheme" (ISS) to boost different verticals of ESDM ecosystem, including LED, in the country under NEP 2019.

An official source indicated that a proposal to provide credit guarantee on term loans for projects up to Rs 100 crore per borrowing unit is in the anvil. These will not require any collateral security or third-party guarantee for setting up a new electronics manufacturing unit or expansion of an existing electronics manufacturing plant and the cover will vary on case to case basis, depending upon investments. According to the proposal, the government may provide up to 50 per cent guarantee cover of the sanctioned loan amount.

Ministry of Electronics and IT (MeitY) is expected to create a fund with the nodal agency for providing guarantees for term loans. MeitY shall provide funds in advance from its annual budgetary allocation to the nodal agency for utilisation under such a scheme.

The CGF will be created with a corpus of Rs 1,000 crore which will be contributed by the government and a review of the scheme will be undertaken after the second year to assess the corpus size in relation to the response from the targeted sector.

Besides this, the government is formulating an interest subvention scheme (ISS) for electronics manufacturers.

The Industry has been seeking term loans on par with internationally acceptable rates. Currently, the industry pays around 11-12 percent interest on term loans availed in India, which are available at around 5-7 percent in other countries. The industry has been demanding an interest subvention of 4-6 per cent from the government on term loans to boost Make in India.

Under the proposal, the ISS scheme will promote electronics manufacturing by partially reimbursing the interest of the term loan availed by the industry for plant and machinery. The scheme will include all stages of the value chain starting from raw materials. It will also include assembly, testing and packaging.

The scheme under consideration proposes to cover term loans for plant and machinery up to Rs 1,000 crore per borrowing unit with a tenure of up to 10 years, to set up new electronics manufacturing plant or for funding expansion of an existing electronics manufacturing unit. Term loans above Rs 1,000 crore will also be eligible, however, the interest reimbursement will be provided only for loan amount of Rs 1,000 crore. Interest subsidy will be made available only on the installments paid after start of commercial production if the proposal is approved by the cabinet.

BOOST FOR MANUFACTURING CLUSTERS

Electronics Manufacturing Clusters 2.0 will replace the existing EMC scheme. A Sovereign Patent Fund will be launched to acquire IPs for chips and to ship components for some commonly used product IPs, so that they can be made available to Indian entrepreneurs at a very low cost.

As part of the new policy, the government is making clusters in which no individual company will manufacture, but a full value chain will be in place. A bigger industry will be supported by smaller industries.

Author: ILLUMINATION EDITORIAL BOARD

A Sovereign Patent Fund will be launched to acquire IPs for chips and to ship components for some commonly used product IPs, so that they can be made available to Indian entrepreneurs at a very low cost.

KARNATAKA TO DEVELOP LED LIGHTING MANUFACTURING CLUSTER

Government of Karnataka is determined to promote LED manufacturing industry which has a potential of creating large scale employment

Karnataka has been the flag-bearer in propelling economic growth via industrialization. As one of the leading industrial states of India, Karnataka has excelled in creating conducive eco-system for entrepreneurs and industrialists across sectors. The state has made commendable strides in the areas of ease of doing business and policy initiatives resulting in creation of a very business-friendly environment.

With the objective to make Karnataka the Manufacturing hub of India and to give fillip to the manufacturing sectors across key districts, Karnataka is planning to develop nine product specific clusters in the identified districts across the state. Chitradurga District has been identified for development of LED Lighting Manufacturing ecosystem.

KARNATAKA - A PREFERRED LOCATION

Karnataka has been the preferred location for investment and stands second in terms of exports from the country. The state is first in services exports and has good connectivity with Chitradurga District. The district is a hub for R&D Centres with IISC, DRDO, BARC & ISRO being set up in an area of 8000 acres. An area of 125 Acres developed land and another 125 acres of land is available for the development of industries at Dhoddularti in Chitradurga District.

The state has good infrastructure facilities and connectivity to sea ports & air ports.

Advantage Chitradurga

- Strategic location of Chitradurga makes it convenient for the manufacturers to sell their products in Western and Southern India (~57% market share*)
- Close proximity airports in Bengaluru, Chennai and Hyderabad provides the logistical advantage in exports
- Proximity to upcoming PCB manufacturing cluster in Mysuru
- Science Hub by IISc, ISRO, DRDO & BARC over 8,000 Acres

Policy Ecosystem for Investment Promotion

ARE YOU COMMITTING AN OFFENCE BY TRADING IN ILLEGAL AND NON COMPLIANT LED LIGHTS ?

IS ----------

R - XXXXXX

As per a market survey report conducted by A. C. Nielsen in 2017 more than 65% of the LED lamps and Downlights available in the Indian markets were found to be illegal, spurious and non compliant with the government safety standards. These spurious products pose a serious safety hazard for consumers as they might cause electrical fires. Moreover such products cause significant loss in tax revenues for the government as they are illegally manufactured and sold. Such non-compliant products may not even perform and be energy efficient as LED lighting should be.

Realizing the seriousness of the problem, Ministry of Electronics and Information Technology (MeitY), Government of India has issued the Compulsory Registration Order as per which all LED Lighting products (including LED Lamps, Downlights, street lights, Luminaire etc) need to be registered with the Bureau of India Standards. To register the products they are first tested for safety as per the applicable BIS standards.

According to the Compulsory Registration Order it is an offence to manufacture, import, store, sell or distribute any LED Lighting products which are not duly registered with the BIS under the CRO and bears the BIS approved "R Number" mark.

It is encouraging to note that to control the growing menace of Illegal and non-standard LED Lighting products the Government of India through its various ministries like Ministry of Consumer Affairs, Ministry of Electronics, GST Authorities, State Controller of Legal Metrology along with the local police and Consumer courts have become very active and are conducting market surveillance, police raids and are prosecuting those who are engaged in the sale of such illegal and non compliant LED lighting products. Further, all procurement authorities and institutions are ensuring that they only buy LED Lighting products which are duly registered with the BIS under the Compulsory Registration Order.

Author: RISHI CHAWLA, CHAIRMAN, INDUSTRY WORKING GROUP, ELCOMA


बहराइच

5

गिरफ्तार व

रंधावा का

चायनीज एलईडी बल्ब का गोरखधंधा उजागर

UPDATES ON BIS STANDARDS

Excerpts from BIS ETD 23 meeting and other BIS related news

COVERAGE OF DC LED LAMPS UNDER THE SCOPE OF IS 16102

During the last meeting of ETD 23 regarding coverage of DC LED lamps under the scope of IS 16102, it was expressed that the 2012 version of IS 16102 covers LED lamps for AC as well as DC supply. However, in the 2017 version, only lamps for AC supply were covered. It was also discussed that there were no separate tests specified in the previous version of IS 16102 for DC LED lamps. Only control gear is required to be changed for DC LED lamps which is covered in IS 15885 (Part 2 / Section 13) 'DC or AC Supplied Control gear.'

It was agreed that IS 16102 is based on IEC 62612 Ed 1.1 in which LED lamps for DC supply have been deleted and after detailed deliberations, it was decided to send the proposal to include DC LED lamps in IS 16102 or to have separate standard for DC LED lamps to committee members for a period of 1 month for their comments. It was also decided to seek clarification from IEC regarding deletion of DC LED lamps from the scope of IEC standard.

Subsequently the committee received a reply from IEC that they had consulted the relevant parties and agreed that the next revision of existing LED lamps (and LED module) standard is covered within the current IEC 63220 – LED light sources – Safety requirements.

The scope of IEC 63220 specifies safety requirements connected to a DC supply up to 1500V or an AC supply up to 1000V. Therefore, the committee will consider including LED lamps with both AC as well as DC supply source.

The proposal by BIS is to either include DC LED lamps under the scope of IS 16102 (since at present there is no separate project regarding LED Light sources) or to have separate standard for DC LED lamps.

REVISION OF LED STANDARDS AND PREPARATION OF NEW STANDARDS FOR PRODUCTS, SUCH AS LED FILAMENT LAMPS

IS 16101, IS 16102 series, IS 16103 series, IS16104, IS 16105, IS 16106, IS 15885 series, IS 16614 (Part 1) and several other relevant standards related to LED including draft documents for LED Tube Light, new standard for LED Filament Lamps, new standard for single capped LED Lamp and other new proposals have been revised or amended by IEC, incorporating important safety requirements like photobiology. However, the same has not been incorporated in case of Indian Standards. Indian Standards will require to be revised soon to incorporate these important aspects. A panel for the same has been constituted and is expected to meet again in the second week of April 2019

BRIEF REPORT OF BIS- ET23 MEETING

ITEMS	ACTION
HPMV Lamps specification – part-II revision required IS9900(2) Doc ETD 23 (6909)	It has been agreed not to pursue this since it is a dying technology
CFL IS 15111- Amendment no. 5 Part-I safety - Regarding inclusion of E-waste rule mentioned in the standard	It was agreed not to include this activity as it is not relevant under BIS purview
CFL IS 15111- preparation of a revised document for the standard	The committee members shall review the new IEC standards and analyse if any changes are required or not
Blue Light Hazard and Photobiological Safety	BEE has funded NPL to establish a Lab for this purpose which is likely to be ready by end of 2019 or early 2020
IS 16102-LED Bulb- to extend wattage up to 60W instead of 25W at present	After debate, it was agreed to extend the applicability of the standard to LED bulbs upto 35W
IS16102-LED Lamp with battery (lead acid) inside	The committee decided to add Emergency Lamp in the standard and giving reference to the Emergency Lamp Standard
IS 16012 - DC LED Lamp - action required for inclusion in standard	BIS shall send separate circular to members for comments. ELCOMA is of the view that there should be a separate standard for DC Lamps and shall prepare a proposal
PL Lamp – updated draft standard was to be prepared	ELCOMA is of the opinion that a standard is not required, as the product is at end of life cycle.
Metal Halide Lamps - Development of safety requirements standard	Due to lack of Lab for photobiological tests, updated data preparation is not possible
LM 79/ LM 80 : IS16103 (Part – 2) LED Modules for General Lighting Part-2- performance required	LM79/80 is expected to be replaced with a new CIE standard. A small committee shall prepare a new/modified document.
LED Filament Lamps	A new standard is being prepared by ELCOMA members for this product

WONDERFUL USES OF LED TECHNOLOGY

LED WALLPAPER

Meystyle is a London-based design company specialising in LED wallpaper, a technology pioneered by them.

Meystyle claim to have been the first company to pioneer the technology to fully integrate light-emitting diodes into the material of the wallpaper so that it can be hanged like a traditional wall covering. Maria Yaschuk, co-founder of the company, together with sister Ekaterina Yaschuk, presented the first prototype of LED wallpaper as part of her graduation project for the MA degree at Textile Futures at CSM in 2004.

The concept was successively developed with her sister Ekaterina into a series of designs exhibited under the name Wire Geometrics at the National Glass Centre in Sunderland. Maria and Ekaterina went on to commercialise their product under the company name Meystyle LED Wallpaper & Fabric.

Meystyle uses digital printing to transfer their designs on a variety of non-woven substrates suitable for wall covering. The LEDs are then incorporated by hand with a special technique that avoids adding any thickness to the material. Meystyle claim their LED wallpaper can be hanged like any standard wall covering with the additional requirement of a power socket or a light switch.

LED ICE, ICE BUCKET AND GLASSES

Parties will never be the same again! LED Ice Cubes, LED Ice Bucket and LED Glasses will make sure there is never a dull moment in any party.

The LED flashing shot-glasses have an LED located in the base that flashes or blinks when liquid is poured into the glass. There are 2 sensors at the bottom of the glass that activate a flashing light function and turn off once empty and dry.

A small caution though : Do not place these LED glasses in a dishwasher. They can only be gently hand washed and moisture must be kept away from the base to avoid contact with batteries. These LED Glasses are made of high quality acrylic and are BPA free.

LED Ice Cubes are a fun way to brighten your drinks and light up your party with all kinds of color! Most LED Ice Cubes come with 8 different color settings built into each glowing ice cube. All you need to do is press the button on the bottom of the lighted ice cube to turn the cube on and off and rotate through the color settings. LED Ice Cubes are 100% liquid proof and drink safe.

The 8 Color and Light Modes are Red, Blue, Green, Red / Blue (Purple), Green / Red (Jade Green), Blue / Green (Aqua Blue), Red / Blue / Green (All Colors), Rainbow Color Changing. These 3 x 3 cm Ice cubes glow for approximately 12-24 Hours depending on the setting.

Compiled by: ILLUMINATION EDITORIAL BOARD

SUBSCRIPTION ORDER FORM

Magazine -INR 100.00 or USD 7.00 per copy

India - 4 issues for Rs. 300 (1 year's subscription) as against Rs. 400
Overseas - 4 issues for 20.00 USD (1 year's subscription) as against USD 28.00
Note : extra 18% GST applicable
Name of Organization : .....
No of Copies required : …… Issue start date……...
Your email address : .....

Your Contact Address:
First Name : .....
Address line 1 : .....
Address line 2 : .....
Address line 3 : .....
City : ……..Pin.....Country.....
Phone:.....

Bank Details for Online Payment:
Name : Electric Lamp and Component Manufacturers' Association of India
Bank Name : Bank of India
Bank Address : M-78, Main Market, Road Number 10, Block M, Greater Kailash II, New Delhi 110048
Account No. : 603710110001910
IFSC Code : BKID0006037
MICR Code : 110013009
Branch Code : 006037
Swift Code : BKIDINBBGK2

Please give details of delivery address:
Name: ..... Name: .....
Postal Address : ..... Postal Address : .....
....
Mobile No : ..... Mobile No.....

Name: ..... Name: .....
Postal Address : ..... Postal Address : .....
....
Mobile No : ..... Mobile No.....

Name: ..... Name: .....
Postal Address : ..... Postal Address : .....
....
Mobile No : ..... Mobile No.....

For subscription related queries, get in touch with us
Mr. Deepak Kumar
Electric Lamp and Component Manufacturer's Association of India (ELCOMA)
202, 2nd Floor, DLF Tower-A, Jasola District Centre, Jasola Vihar, New Delhi -110025
Tel : 011-41556644/46604947 Email : deepakkumar@elcomaindia.com,

.nxt™
next generation light

LIGHTS THAT ENSURE **COMFORT** AND **PRODUCTIVITY.**

Explore our **Freedom range of lights** that comes in four amazing designs. They light up workspaces efficiently and enable bright minds to work comfortably and perform better.

FREEDOM RANGE


PETAL


DELTA


DIAMOND


RIPPLE

Up to 125 lm/W
Lower LPD for improved sustainability and green building rating

Dimming Compatible
Simplified upgrade to smart office

Thermo-formed Drop Diffuser
For increased volumetric illumination

THD <10%

28 Wattage

CRI 80

BAJAJ
Bajaj Electricals Limited

601, Rustomjee Aspiree, Bhanu Shankar Yagnik Marg, Off Eastern Express Highway, Sion (E), Mumbai - 400 022.
Tel: 022 2406 4400 | Email: luminaires@bajajelectricals.com | www.bajajelectricals.com
/BajajElecBiz /BajajElecBiz /bajajelecbiz /BajajElectricals

PHILIPS

Enhancing your world with connected lighting

That's how Philips Lighting is taking Light Beyond Illumination

innovation you

To know more about our connected lighting solutions visit www.lighting.philips.co.in

SURYA
TOTAL LIGHTING SOLUTIONS

Intelligent LED Lighting Solutions

for all diverse lighting needs

Surya's Luminaire Business Group (LBG) seamlessly integrates cutting-edge technology and pioneering innovations. Our aesthetically appealing Luminaires range includes Commercial Lighting (Indoor & Outdoor), Street Lighting, Landscape Lighting, Industrial Lighting & Architectural Lighting. They are NABL approved and answer to all your lighting needs.

Commercial Lighting (Indoor & Outdoor) | Street Lighting | Landscape Lighting
Industrial Lighting | Urban Lighting | Architectural Lighting

SURYA ROSHNI LIMITED

E-mail: consumercare@sroshni.com | www.surya.co.in | Tel.: +91-11-47108000, 25810093-96

/suryalighting | /surya_roshni **Toll Free No.: 1800 102 5657**