

ELCOMA

Electric Lamp & Component Manufacturers'
Association of India
MEMBERS' DIRECTORY 2021-22



Illuminating India. Creating history.

Bajaj Electricals is India's **one-stop lighting solution** provider, innovating lighting technologies for the past eight decades.

Architectural Lighting

The prestigious Bogibeel Bridge illuminated by Bajaj Electricals.



Street Lighting,
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Architectural &
City Beautification
Lighting



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Smart Building
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Lighting



Bringing light to life LEDiving® HL PREMIUM

OSRAM provides a wide range of LED replacement lamps for various applications. The latest LEDiving® HL PREMIUM products, provides you with stylish white lights and clear beam pattern, that allows to see farther and therefore react sooner. Better seen and be seen, signs, obstacles and hazards can be recognized sooner. Upgrade your vehicle's headlamps now-for a safer journey.

Light is OSRAM

OSRAM

*These products do not have ECE app. oval.



Light is emotion PAR Light for Buildings, Hotels and Monuments



Light is OSRAM

OSRAM

OSRAM PAR Light Sales Force: NORTH INDIA: Satyajit Biswas 9643408073;
WEST INDIA: Sagar Dwivedi 7836996673; SOUTH & EAST INDIA: Naveen Kumar 9985007143

SURYA

PROFESSIONAL LIGHTING SOLUTIONS

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INDUSTRIAL LIGHTING



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 are NABL approved and the answer to all lighting needs



Airports



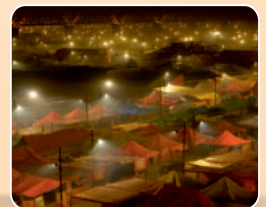
Petrol Pumps



Highways



Bridges



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MORE INNOVATION BETTER DESIGN



#ADVANCINGLIGHT



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customer@ledvance.com
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LEDVANCE is licensee of product trademark
OSRAM for lamps products in general lighting.



PRESIDENT'S MESSAGE

I am pleased to release 8th edition of ELCOMA members' Directory for the year 2021-2022. ELCOMA Secretariat has put in lot of efforts in compiling this directory.

Lighting industry in the last year has undergone a massive disturbance due to COVID-19 pandemic. This is happening all over the world. In India, however, pace has slowed down and industry seems to be on the road to recovery.

The Central Government is proactively supporting by creating a public distribution system for LED retrofit lamps through EESL. While this initiative of Central Government has helped the industry to scale up the business operation faster and bring down the input cost, resulting into reduction of selling price. But on the flip side, the market has become more competitive due to reduced consumer price making LED products more affordable.

ELCOMA members who have proactively been making in India for the last 70 years had shifted to assembly route by importing LED components. Now since LED business has stabilized, ELCOMA has prepared a Vision 2024 under which it will be endeavor to make at least 60% to 70% of components in India and also export a better part of India made products.

In 2013, ELCOMA prepared a Vision 2020 document which proposed to reduce power consumption in lighting sector from present 18% to 13% thus saving more than 27000 megawatts of power. The government in 2014 adopted this plan and appointed Energy Efficiency Services Limited (EESL) to execute the same.

Streetlights are emerging as another important segment as existing streetlights are being replaced with LEDs. After successful pilots, EESL is now planning to supply 30 million streetlights in rural areas.

It is challenging and competitive time for the industry and existing lighting companies as new players are entering this arena with newer competencies and more cost-effective business models. ELCOMA is looking at Intelligent Lighting as a technology of the future and though this is a challenging segment, the Indian lighting Industry is fully prepared to face this challenge.

ELCOMA, as usual, shall keep playing its pivotal role of bringing awareness on energy conservation by organizing various workshops, seminars and exhibitions to promote efficient lighting.

No publication can be successful unless it meets with the requirements of the industry.

I request you to please interact with the ELCOMA Secretariat with your suggestions and ideas to improve the directory and make it more informative in future.

I thank all ELCOMA members, advertisers and contributors of articles whose support has enabled us to bring out this valuable guide for all stake holders.



A handwritten signature in black ink, reading "Sumit Joshi".

SUMIT PADMAKAR JOSHI
President, ELCOMA



ELCOMA OFFICE BEARERS 2021-22



Mr. Sumit Padmakar Joshi
President, ELCOMA



Mr. Avinder Singh
Vice President, ELCOMA



Mr. Anuj Poddar
Treasurer, ELCOMA



Mr. Raju Bista
Immediate Past-President, ELCOMA

Electric Lamp & Component Manufacturers' Association of India

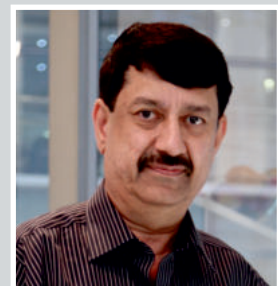
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THE GOVERNING BODY 2021-22

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17. Member	Mr. Anirudh Kajaria	Century LED, Kolkata
<u>Special Invitee:</u>		
18. Member	Mr. E. Sivaramakrishnan	Luker Electric Technologies Pvt.Ltd., Kochi
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20. Advisor	Mr. Sunil Sikka	ELCOMA, New Delhi
21. Secretary General	Mr. Shyam Sujan	ELCOMA, New Delhi
22. General Manager	Mr. Amal Sengupta	ELCOMA, New Delhi



Mr. Shyam Sujan
Secretary General, ELCOMA



Mr. Sunil Sikka
Advisor, ELCOMA

ELCOMA MEMBERS LIST

Sr.No.	Company	Tel & Mob	Fax	E-Mail	Address
1	Alien Energy Pvt. Ltd.	011-22372828	011 2895504	akash2316@gmail.com/ akashjain@alienenergy.in	A-16/6 OMSAI Complex, Site - 4, Industrial area, Sahibabad, Ghaziabad. Uttar Pradesh - 201010
		7840047512 / 26		monikazain28@gmail.com	91, Kiran Vihar, Karkardooma, New Delhi, Delhi - 110092
2	Arvind Press Caps Ltd	01493-298066	01493 220295	apclexp@rediffmail.com	E-337, RIICO Ind. Area, Bhiwadi (Dist. Alwar), Rajasthan - 301019
				shaleenkaushik@apclnewar.co.in	
3	Atco Controls (India) Pvt. Ltd.	022-22025528	022-22022304	bhavin@tridonic.co.in	38-B Nariman Bhavan, Nariman Point, Mumbai, Maharastra - 400021
4	Arosan Plastics Pvt. Ltd	011-28116777	011-45501100	Saheb@arosonglobal.com	B-90, Mayapuri Industrial area, Ph-1, New Delhi, Delhi-110064
5	Bajaj Electricals Ltd.	91 22 24064200	022-24064003/ 022 22851279	cmd@bajajelectricals.com	Mulla House, 51 Mahatma Gandhi Road, Fort, Mumbai, 400001, India, Mumbai, Maharastra-400001
				anuj.poddar@bajajelectricals.com	Rustomjee Aspire, 7th Floor, Bhanu Shankar Yagnik Marg, GTB Nagar, Lalbaug, Everard Nagar, Sion, Mumbai, Maharashtra 400022
6	BAG Electronics India Pvt.Ltd	020-30450700/ 020 -67551701	283610	b.praveen@bagelectronics.in/ mdindia@bagelectronics.in	Survey No. 19, Yewalewadi, Kondhwa Road, Pune, Mumbai, Maharashtra-411048
				m.joshi@bagelectronics.in	
7	CEMA Electric Lighting Products India Pvt. Ltd.	0484-2809341/ 426464955		nandakumar@cemalighting.com	34/389-B & C, Mullassery, Padivattom, Edpally P.O., Cochin-24
		011 4302 3439	011 4302 3437	ramesh@cemalighting.com	804, 8th Floor, Ansal Vikas Deep Building, Plot No. 18, Laxmi Nagar, Distt. Centre, New Delhi, Delhi-110092
8	Crompton Greaves Consumer Electrical Ltd	0266-245245/ 245001-022- 61678499	022-25787283	mathew.job@crompton.co.in	Equinox Business Park, 1st Floor, Tower 3, Lbs Marg, Kurla (W), Mumbai, Maharashtra-400070
		022-61678499/ 02662-245304	0266-245245	vishal.kaul@crompton.co.in,	
9	Captain Gears & Fans	0120-4203318/ 19,9953147253		surinder@compactlighting.net/ compact@compactlighting.net	D-35, Sector-11, Noida, U.P-201305
		0120-4203318/19		chandni@compactlighting.net	B- 84, Sector-80, Phase-II, Noida, U.P-201305
10	Century LED Limited	1800 3451345		ak@centuryled.in	Srijan Industrial Logistic Park, Block-A, 1st Floor, NH-6, Bombay Road, Ankurhati, Domjur, Howrah, Kolkata 711302 West Bengal
		033-2669-5591/ 033 3055 4060		gopal.singh@centuryled.in	
11	Corvi LED	9920260260		vimal.soni@corvi.com	5th Floor, Notan Chambers, Turner Road, Bandra West, Mumbai- 400050, Maharashtra
				vikrant.pathare@corvi.com	
12	Dixon Technologies (I) Pvt. Ltd.	0120-4737200	0120-4737261	sunilvachani@dixoninfo.com/ info@dixoninfo.com,	B-14/15, Phase-II, Noida 201305 U.P
				atullall@dixoninfo.com	
13	Devtech M2M Limited	020-30516199	020-30516161	parikshit@devtechm2m.com	SAVA House, 4th Floor, Off New Aiport Road, Viman Nagar, Pune 411014 Maharashtra
				vinod@devtechm2m.com,	Gat No. 645, Behind Bharat Petrol Pump, Opp. Kesnand Phata, Wagholi Tal. Haveli, Dist. Pune 402207 Maharashtra
14	Eveready Industries India Ltd.	033-24864961/ 033-24559213/ 30587822		bjmoorthy@eveready.co.in	2, Rainey Park, Kolkata 700019 Kolkata
			033-24864673	chandra.rathour@eveready.co.in	
15	Fiem Industries Ltd.	0130-2367905/ 906/907/909/910	011-25927740	jkjain@fiemindustries.com, / cmdoffice@fiemindustries.com	Corporate office & Unit 1, 32 milestone, GT Road, Kundli, Sonapat 131028 Haryana
				gv.george@fiemindustries.com	32 Milestone, GT Road, Kundli, Sonapat ,Haryana, India. Sonapat 131028 Haryana

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16	Fulham India Pvt. Ltd	022 66388775/76	022 66388778	gmalkani@fulham.com	01, Sukhada Bldg. Ground Floor, Sir Pochkhanwalla Road, Worli, Mumbai 400030 Maharashtra
		020-24690703 / 4		sgghose@fulham.com	S. No. 26/3, Village Narhe Tal - Haveli, Pune 411041 Maharashtra
17	Fluxlite Nims Pvt.Ltd	0141-2771980		cmdfluxlitenims@gmail.com / chancellornims@gmail.com	Plot no. G-986 to G-991, Sitapura Ind. Area, Ph-3, Jaipur 302022 Rajasthan
				pradeep@fluxlitenims.com	
18	Halonix Technologies (P) Limited	0120-4756103/ 0120-4656300	0120-4756101/ 011-23232639	rakesh.zutshi@halonix.co.in	B -31, Phase II, Noida 201305 U.P.
		0120-4756107		kumar.gaurav@halonix.co.in	
19	Havells India Limited	0120 - 3331000	0120 - 3332000	Prag.Bhatnagar@havells.com	QRG Towers, 2D, Sec 126, Expressway, NOIDA 201304 U.P.
		0120-4771000		subrata.sen@havells.com/ marketing@havells.com	
20	HPL Electric & Power Pvt. Ltd.	0120-4656300	011 23232639	gautamseth@hplindia.com	1/21, Asaf Ali Road, New Delhi 110002 Delhi
				nirajtiwari@hplindia.com	Windsor Business Park B1D, Sector-10 Noida 201301 U.P.
21	Ibahn Illumination Pvt.Ltd	07290070893		rajeevc@svarochi.com	T-1, 2nd Floor, Okhla Phase-2 New Delhi 110020 Delhi
		7290-070-895		arjuns@svarochi.com	
22	Indo Japan Horologicals Pvt.Ltd	033-40687043		m.bothra@indojapn.in,	J/12, Block EP, Sector-5, Salt Lake, Kokata 700091
				ashok.mukherjee@indojapan.in, a.bothra@indojapan.in	
23	Jaquar and Company Pvt.Ltd	0124-474800		mohit.sharma@jaquar.com	Plot No. 3, Sector-11, IMT Manesar, Gurgaon 122050 Haryana
				gaurav.bhalla@jaquar.com	
24	Just About Power			deepak@justaboutpower.com	178, Patparganj Industrial Area, New Delhi 110092 Delhi
					#34 Bhagwan Nagar, Ashram, New Delhi 110014 Delhi
25	Keselec Lighting Private Limited	011- 4162 9828/ 0129-4117388/ 0129-4022804	129 4117 389	chekitans@keselec.com	55, Industrial Area, NIT, Faridabad 121009 Haryana
				mayankkg@keselec.com	210, Charmwood Plaza, Eros Garden Colony, Charmwood Village, Near Suraj Kund Road, Faridabad 121009 Haryana
26	Kwality Photonics Pvt. Ltd.	91(040)27123555, 27136252	040-27124762	kvkgupta@kwalityindia.com/ sales@ledchipindus.com	29AB, 2 F, Electronic Complex Kushaiguda Hyderabad 500062 A.P.
				kwalitypolywa@gmail.com/ sales@kwalityindia.com	
27	Khaitan Electronics	033-40089351	033-22254486	a.sengupta@khaitanwire.com	P-38, India Exchange Place, Arun Chambers, Kolkata 700001
				a.khaitan@khaitanwire.com	
28	Litex Electricals Pvt. Ltd	020-66301072		dradk@hotmail.com	W-134 S Block, MIDC, Bhosari, Pune 411026 Maharashtra
		020-66301073	022-27120056	svr@litexelectricals.com/ skarkarey@hotmail.com	
29	Lighting Technologies India Pvt.Ltd	080-67303700		hari.nkv@ltcompany.com, info@ltcompany.com	No. 40, Jignani Industrial Area, 1st phase, Sy. No. 5927124, Jignani Village & hobli, Anekal Taluk, Bangalore 560105 Karnataka
30	LEDVANCE Private Limited	0124-4150100	0124-4081577	k.sujan@ledvance.com	11th flr. Signature Tower B, South City, Gurgaon 122001 Haryana
				r.agarwal@ledvance.com	
31	Luker Electric Technologies Pvt.Ltd	0484-3368331/ 32/33/34/35		jk@lukerindia.com	34/1912C1, Mattathil Lane, BTS road, Edapally, Kochi 682024 Kerela
				srk.luker@gmail.com/ srk.e@lukerindia.com	2nd Floor, Jain Tower, NH Bye pass road, Opp lulu Mal, Kochi 682024 Kerela
32	Luminous Power Technologies Pvt.Ltd	0124-4776700	0124-2544170	jitendra.agrawal@luminousindia.com	Plot no. 150, Sec-44, Gurgaon 122003 Haryana
		0124-477767		naveen.saxena@luminousindia.com	
33	Mercury Lamps Pvt. Ltd	0135-2430168	0135-2432168	mercurylampspvtltd@gmail.com/ mplrshikesh@gmail.com	64, Laxman Jhula Rd., Rishikesh 249201 Uttranchal
				mercurylamps@sancharnet.in	

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		0129-4085497			
35	MLS India Pvt.Ltd	0124-4867400/401		shobhit.bhasin@mlsindia.net	1201& 1202.Tower-A, Signature Towers, South City-1, Gurugram 122003 Haryana
36	Orient Electric	0120-4894900		puneet.dhawan@orientelectric.com	C-130, Sector 63, Noida 201301 Delhi
				santosh.agnihotri@orientelectric.com	
37	OSRAM Lighting Private Limited	0124-6261300		avinder.singh@osram.com	1st Floor, Plot No. 03, Sector-32, IFFCO Surinder Jhakar Bhawan, Gurgaon 122001 Haryana
				N.Saxena@osram.com	
38	Signify Innovations India Ltd (Philips)	0124-46635555/ 4606260/ 4606000	0124-4606666	sumit.joshi@signify.com	8th Floor, DLF -B, DLF Cybercity, DLF Phase-3, Gurgaon 122002 Haryana
				sukanto.aich@signify.com/ support.philipslightingindia@signify.com	9th Floor, DLF -B, DLF Cybercity, DLF Phase-3, Gurgaon 122002 Haryana
39	Panasonic Life Solutions India Pvt. Ltd (Anchor)	022-422 8888	022-30418885	Raja.Mukherjee@in.Panasonic.com	3rd Floor, B Wing, I-Think Techno Campus, Pokhran Road No 2, Thane West 400607 Maharashtra
		022-30418710/ 022-30418888		Rohit.patel@in.Panasonic.com	
40	Prompt Services	9552002172		ceo@eetamax.com	Plot No. L-141, MIDC Industrial Area, Ahmednagar- 414111 Maharashtra
				mihir.joshi@eetamax.com	
41	Rishab Industries Ltd. (Cenzer)	020-66305241	022-61116633		Plot No. 54, Mapusa Industrial Estate, Mapusa, Bardez, Goa 403507 Maharashtra
		022-61116666		mayurcenzery@yahoo.com,	20-B, Sugra Building, 2nd Floor, 16th Tribhuvan Road, Mumbai 400004 Maharashtra
42	RK Lighting Pvt. Ltd.	022-67124462/63		rklights@gmail.com	223, Adhyaru Industrial Estate, Sunmill Compund, Lower Parel, Mumbai 400013 Maharashtra
43	Surya Roshni Ltd.	011-25810093 -96	011-25789560	jpa.surya@gmail.com	Padma Tower I, 2nd Floor, Rajendra Place New Delhi 110008 Delhi
				raju@surya.in	
44	Starlite Lighting Ltd.	0253-2354423/24	0253 2350832	rb@starlitelighting.com	6, M.I.D.C., Area, Satpur, Nasik 422007 Maharashtra
		0253 2350365		vshivkumar.nair@starlitelighting.com	
45	SYSKA LED Lights Pvt.Ltd	020-40131000	020 -25150157	rajesh@saskinfotech.com	Syska House, Sakore Nagar, Lane 4, Airporr Road, Behind Maruti Suzuki Showroom, Pune 411014 Maharashtra
				swapnil.s@saskgroup.in	
46	Techno Electromech Pvt.Ltd	07600248768/ 76000248968		saurabh@technoelectromech.com	RS No. 858, Suresh Timber Lane, Opp. GSFC Main Gate, NH-8, Vadodara 390750 Gujarat
				tej@technoelectromech.com/ led@technoelectromech.com	
47	True North Technologies Private Limited	0120-3874869/ 0120 387 4851		rajeev.jindal@true-north.co.in	A-163, Sector-80, Noida Phase-II, Noida 201305 U.P.
		011-69049000	011-26847342/ 26829063	info@true-north.co.in	222, Okhla Industrial Estate Ph-3, New Delh 110020 Delhi
48	Usha International Ltd	0124-4583100	0124-4583200	vikas_gandhi@usha.com	Plot No. 15, Institutional Area, Sector-32, Gurgaon 122001 Haryana
				rahul_bhandari@usha.com	
49	Wipro Enterprises Limited	080-28440011	080-28440057	vineet.agrawal@wipro.com	CCLG Division, Doddakannelli, Sarjapur Road, Bangalore 560035 Karnataka
		0240-2351291	8440059/080-28440011	sanjay.gupta5@wipro.com	

THE ELCOMA STORY

About ELCOMA

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

ELCOMA, representing the Indian lighting industry aims to act as an important link to support each other in matters connected with lighting industry, to promote and develop co-operation among the manufacturers of electric lamps and components and to further facilitate the overall interests of its members. The association has been helping upgrade the knowledge and technical capabilities of its members through liaison with other relevant organizations both in India and abroad. In earlier 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 inspite of inflation, energy price increases and other price rises, the price of lighting products have become more cost effective. With the success achieved by the Association, new entrants to the lighting industry from organized as well as small sector readily became members and took active interest in the growth and development of the lighting industry.

Functions and Services

The main objectives of ELCOMA and its functions and services are as under:

- To enable manufactures of lamps and components to federate or corporate by becoming members or associates of the Association, either by themselves or their nominees or act as their representatives or spokesmen for such manufacturers.
- To promote and develop co-operation among the manufacturers of electric lamps and other ancillaries and business and to further facilitate the manufacture of products in particular.
- To promote the consideration and discussion of all questions affecting lamp industry and all ancillary and allied trades, and every branch of such trade and to generally watch over and protect the interest of persons engaged in the manufacture of such products.
- To diffuse among its members information on all matters, affecting the lamp manufacturers to print and publish, issue and circulate such papers and periodicals, circulars and other material relevant as may be seen conducive to any of these objects.
- To promote the distribution of products to all consumers throughout India by the members of the Association and with the object of fostering and promoting es-pirit-de-corps among the lamp manufacturers in India.
- To collect information and circulate and publish the policies and activities of the Association from time-to-time by pamphlets, circulars, or news bulletins.
- To organize exhibitions, conduct seminars, conferences, symposia, lectures and publish its official bulletin, 'ELCOMA' News Letter and make known to public the activities of the Association.
- To provide to its members statistical information pertaining to lamp industry and keep the members informed regarding latest technical development, quality control and achieve standards and specifications.
- To be in close touch and establish liaison with various institutions and organizations and government bodies connected with the development of Electric Lamp and Component Industry and to carry continuous dialogue with the govt.
- To make representations and to deal with the subjects that affect the Electric Lamps and Component Industry and find ways and means of solving the problems and difficulties relating to subjects like finance, import-export, supply of raw materials, machinery and spares, taxation (all types-customs, excise, octroi, sales tax and GST etc), industrial relations, procedural delays, factory enactments, power, transportation etc.
- To carry out such acts as maybe required for the benefit of the industry to upgrade themselves in terms of knowledge/ technology etc.
- To educate and inform the consumer on the developments in the industry and help the nation to save energy and costs through introduction of better products and applications.
- To act as a link between lighting and other industry association in India and worldwide in matters concerning common interest.

NATIONAL INSTITUTE FOR TECHNICAL SKILLS

(ELCOMA Initiative on Training)



ELCOMA offers various technical skill development training programs for government and industry for products and services in lighting and electrical appliances domains.

Currently we offer technical training programs for LED Streetlights, Solar Streetlights, Domestic Electrician, Health & Safety and Refrigeration & Air Conditioning. These programs have been developed along with Power Sector Skills Council (PSSC) and Electronic Sector Skills Council (ESSCI) based on National Occupation Standards (NOS) of National Skills Development Council (NSDC). We are also developing two new programs in Lighting Design and Intelligent Lighting.

ELCOMA has appointed National Institute for Technical Skills as its authorized training partner to offer various programs designed by ELCOMA. Under the supervision of ELCOMA, NITS is being mentored by Industry to nourish the skill of people working in lighting and related industries.

We have trained over 700 field personnel for EESL in Street Light National Program (SLNP) across India in the past 1 year. We have also conducted health and safety programs for EESL and industry personnel.

ELCOMA/NITS have already published three training guides for candidates attending these programs.

Programs Offered:

- 1 Streetlight Installation and Maintenance Training Program for Streetlight Technicians/Supervisors:**
Introduction to Lighting and Lighting Industry • Basics of Road Lighting and Design • Installation and Commissioning • Operation and Maintenance • Site Safety • Health and Safety • Field Demonstration and Practical Training
- 2 Solar Streetlight Installation and Maintenance:**
Introduction to Energy • Overview of Solar Power and Lighting • PV Technology • Battery Technology Lighting and its Design • Installation and Commissioning • Operation and Maintenance • Health and Safety • Field

Demonstration and Practical Training

- 3 Domestic Electrician (+ Home Appliances) Certification Program:** Introduction to Energy and its sources • Electricity and Power • Installation of Domestic appliances and Electrical Equipments • Repairing and Troubleshooting • Safe Operating Methods and Safety at Work • Hands on Assembly and Repair of Appliances
- 4 Refrigeration and Air Conditioning:** Introduction to Energy and its Sources • Electricity, Thermodynamics and Power • Heat Management Installation of different types of Refrigerators and AC & their Commissioning • Operation, Repair and Maintenance • Site safety and safe operating procedures • Practical Site Installation
- 5 Health and Safety Training:** Safety and its overview • Occupation Health and Safety • First Aid • Fire Safety • Job Safety Analysis Documentation and policy making • Safe working practices • Handling Emergency
- 6 Lighting Design:** Introduction to Lighting Theory • Overview of Lighting Design Standards • Understanding Lighting effects • Lighting Applications • Lighting Designing Software and introduction to DIALux • Lighting Planning and Schematic Designing • Development of Lighting Design • Photometry and its analysis Post Occupancy Evaluation • BOM calculation • Case Studies
- 7 Smart Lighting and CCMS:** Introduction to Lighting • Lighting technology and its integration with IoT • Smart Lighting trends Software and Hardware Architecture • Introduction to Communication technologies (Zigbee, LoRaWAN, RF based, GSM, GPRS) • Introduction to Li-Fi • CCMS (Centralized Control and Monitoring System) • International and National Case Studies • Health and Safety.

Contact Person : Mr. B.M. Bhatia

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 ELCOMA

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FUTURE IS INTELLIGENT LIGHTING

The technological development in Lighting has been very slow ever since Edison invented Incandescent Lamp. However, the last two decades have seen sudden spurt in new energy efficient lighting products being introduced.

We had CFL revolution from 2006 to 2015, Slim fluorescent tube lights, electronic ballasts. The Vision 2020 document prepared by ELCOMA was very well received by government and consumers with the result, lighting manufacturers are looking at another revolution in LED Lighting. It is difficult to imagine our society without electric lighting. The government has realized that to accelerate economic development, it is very essential to provide basic facilities to all citizens. Lighting is one of the most important considerations. It is planned that all corners of the country will be lit up with Lighting whether it is with grid or off-grid. Over the years the demand of lighting has increased with more and more applications being introduced to help a more effective and meaningful lighting. Citizens are learning to use best lighting options available to them, whether it is required for work, for buildings, for monuments, or creating ambience and moods at any place. People are learning and indulging in leisure at all times of the

day and night and this has been made possible because of the contributions of electric lighting. The flexibility of our working hours, the demands by our complex tasks, the introduction and progress of information technology and a paperless office environment, the speed at which we travel, all demand seamless illumination to ensure optimum performance. Day moves to night while we also shift from outdoor to indoor demanding visual accuracy, comfort and guidance to go on with our activities without making any serious promises. The ELCOMA Vision 2020 has successfully been able to fulfill the initiative to reduce energy consumption for lighting from 18% of total power consumption to 13% by

VISION SMART LIGHTING

To make the Indian Lighting industry a leader in SMART and EFFICIENT lighting that is advanced in technology, user friendly and is environmentally conscious. To make and develop a sustainable world-class, global manufacturing hub for modern lighting.





friendly to provide not only fun but also effectiveness of LED lighting. This will provide more secure and safe environment at public places.

Vision Smart Lighting

After the government announcement of 100 smart cities, the industry is preparing itself to provide equally smart lighting for the smart cities. Over the next few years, the Indian Lighting industry will focus on smart lighting in following areas. ELCOMA looks at vision and inputs required:

- Continue efforts to create demand for energy efficient lighting products to reduce India's lighting power consumption further
- Smart Lighting requires high technology support and needs to expand domestic capacity for LED testing and R&D centres to support this new increasing demand

year 2018 by introducing more energy efficient products and working with government to execute various schemes and awareness programs to achieve this. The government announced that 770 million LED Lamps and 30 million Street Lights will be replaced in India by year 2018. Both EESL and Industry has jointly already sold more than 800 million LED Lamps by end of 2017. It is estimated that more than 1.2 billion mark was end of 2018. All this will have save more than 27,000 MW of power by the end of 2019.

Enter the Smart Lighting

Like mobile phone revolution in which new applications have made the product very interesting and new demand is created on regular basis. Similar will be the future of LED Lighting. LED Lighting being versatile product which can be used for any lighting application, will now play very important role in bringing in smart (or intelligent) lighting. ELCOMA has prepared The VISION document in which new concepts in smart lighting have been spelt out. The industry will now create and initiate manufacturing and marketing of smart lighting in India. Besides this, it can also create techno fun for users as LED lighting will work with new applications of dimming, smart controls, colors, performance reporting etc. Government has already announced creation of 100 Smart Cities. Elcoma has prepared a vision for these cities on new intelligent technologies that will be more versatile and user

- Prepare Indian standards for all future smart lighting products and applications and make these standards mandatory immediately to avoid entry of cheap products offering smart features.
- Enhance manufacturing capabilities in Luminaires, electronic components and LEDs
- Leverage Indian ITES skills to grow Lighting Automation software development
- Support skill development across all discipline required by the lighting industry through R&D centres and educational institutions, and training centres specific to intelligent lighting
- A new force is required to be trained in use and operation of smart lighting to train the users. In order to achieve these, there are various imperatives for the key stakeholders in this industry.
- **ELCOMA:** To create domestic and international workshops for training on new technologies. Generate demand through awareness programs and seminars on

Smart applications for products focusing on smart cities. application, & testing etc. Support the set-up of testing, R&D and educational centres. Elcoma has already conducted 4 such seminars in one year. These seminars will be continued during 2020-22 at secondary towns like Bangalore, Thiruvanthapuram, Vishakhapatnam (Vizag), Raipur, Jaipur etc.

- **Smart Street Lights:** The smart street light is future in street light segment. The smart pole will provide access to eye soothing street light, Wifi public address system, 2 way communication with police control room, CCTV cameras etc. We need to create demand for smart street lights in it's already plan for all public spaces and make it mandatory for all smart cities to change to smart street lights.
- It is very important to create India as export hub for smart lighting
- Government is required to support local manufacturing over imports through subsidies and incentives. It is very essential to control unauthorized product by doing surveillance, announce anti-dumping duty, limited FDI restrictions, etc.



WHAT IS SMART LIGHTING?

- *Smart lighting incorporates many technologies so that either indoor or outdoor lights will work automatically under certain conditions. Different smart lighting networks do different things, but some of the more popular solutions feature smart lights that are capable of instantly switching on when someone enters a room or changing colour when something occurs, for example.*
- *Imagine your house has 50 lights, and each light is normally controlled by the flick of a switch. Smart lighting eliminates the need for you to get up and flick that switch. The network does all the work for you, automatically, though you can still program the lights to respond as you wish. Smart lights often feature sensors too, so they can identify people and things like when they need light, as well as how much they may need.*
- *The last bit to remember: smart lighting networks often allow lights to interact with each other, so that they can be calibrated en masse, or even individually through a remote control setup.*
- *Smart lighting networks vary drastically, but generally, their lights can either work independently or together when connected. Keep in mind there are two main types of smart lights: sensor-integrated and non-sensor integrated.*
- *Sensor-integrated lights feature sensors that enable them to recognise people and daylight, among other things. These lights automatically send data to the smart lighting network, which sets specific parameters for each light. You can still manually control sensor-integrated lights however, if you desire. Although non-sensor integrated lights don't have sensors, they're still considered smart, because you can program them.*
- *There are two main ways of controlling smart lights: control hubs and smart devices. You can use tablets, smartphones, laptops, and even desktop computers (as long as both the device and the smart lights are connected to Wi-Fi or Bluetooth) to remotely configure and manage your smart lighting. In some situations, typically in larger buildings, there is a dedicated control hub that maintains the smart lighting network.*
- *As a consumer, you'll probably want a smart lighting setup that works with your smart device. Not only is that the more user-friendly option but you'll be able to control your house lights from anywhere in the world (not just when at home). That said, whether you choose sensor-integrated lights or non-sensor integrated lights is up to you. Typically, sensor-integrated lights are the more costly option.*
- *For using smart lighting, there are four reasons why you should use smart lighting. First and foremost it can save you money on a utilities bill. That's because a smart lighting network is very energy efficient; it allows you to calibrate when exactly a light should be on. Smart lights can also simplify your life. When preparing to travel, you won't have to physically alter the settings of each smart light or check to see if it is off before you leave. You can do all this remotely, from afar. In a nutshell, smart lighting is wireless lighting that interacts with the users, makes its performance more interesting and saves ample energy whenever required.*



INTERNATIONAL SOLID STATE LIGHTING ALLIANCE



ISA is a non-for-profit organization consists of regional alliances, association/society, leading companies and renowned universities in global Solid State Lighting (SSL) field.

The Business of ISA members have covered the whole SSL value chain of upstream, middle stream and downstream of global SSL industry such as epitaxy, packaging application, materials and equipment, design system integration and testing etc.

Currently, ISA has 76 members, representing more than 4000 individuals & organizations includes major players (such as Signify, Osram, San'an, Unilumin, MLS, Panasonic, AIXTRON etc.). The output of which covers more than 70% that of global SSL industry.

The ISA Board of Advisers consists of leading experts and academic "Founder" level experts, such as the inventors of blue LED, yellow LED, Red LED, and OLED. Amongst Professor Shuji Nakamura, the Laureate of Nobel Prize in Physics in 2014 is the Co-Chair of ISA Board of Advisors (BOA) and Professor Hiroshi Amano the Laureate of the Nobel Prize in Physics in 2014 is the member of ISA BOA. The current president of ISA is Dr. Jianlin Cao, the former vice minister of Ministry of Science and Technology, China.

The Major Work of ISA

- ISA Technical Committee on Standardization (TCS)
- Global SSL Industry Research (Global SSL Industry Report)
- The Secretariat of the BRICS SSL Collaboration Working Group
- International/Regional Cooperation on SSL
- Global SSL Awards (Award of Outstanding Achievement for Global SSL Development; Award of Global SSL TOP 100 Innovation; Award of Global SSL Outstanding Industry Development Contribution)
- ISA-ECC Smart Street Lighting System Specialized Committee
- ISA LiFi Committee
- Global SSL Forums and training workshops
- LED Disease Control Working Group
- ISA Micro-LED Committee
- "One Belt and One Road " Joint Research Center for SSL Technology and Application



President



Dr. Jianlin Cao
Former Vice Minister of Ministry of Science and Technology, China
Deputy Director of the Committee of Education, Science, Culture, Health and Sports

Council of Management



Ms. Ling Wu
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Former President of Illuminating Engineering Society of Australia and New Zealand (IESANA)



Dr. Alexander Karev
Russian Association of LED and SSL Manufactures



Mr. Shyam Sujan
Secretary General of the Electric Lamp and Component Manufacturers Association of India (ELCOMA)



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Professor of Electrical, Computer and Systems Engineering
Rensselaer Polytechnic Institute, USA
Chairman of ISA-ECC Smart Street Lighting System Specialized Committee



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Professor of University of Edinburgh



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Tran Quoc Khanh
Professor and Head of the Laboratory of Lighting Technology, Technical University in Darmstadt



Frederic Guan
Former Vice President of the Illumination Industry International Association, USA



Russell Dean Dupuis
Professor, Center for Semiconductor, School of Electrical and Computer Engineering, Georgia Institute of Technology



Wolfgang Kowalsky
Professor of Technical University Braunschweig



Siegfried Luger
CEO, Luger Research Institute for Innovation & Technology CEO, LED Professional Magazine



Iacopo Rossini
Technical Director of the Brazilian Association of the Lighting Industry (ABRILUX)

Title of Harald Haas is changed to: Distinguished Professor of Mobile Communication,

Director of LiFi Research and Development Centre (LRDC), University of Strathclyde, Glasgow

Chairman of ISA LiFi Committee

Current Members (76 Total)



ISA Global SSL Industry reports:



Executive Members:



GLOBAL LIGHTING ASSOCIATION



The Global Lighting Association is the voice of the lighting industry on a global basis. GLA fosters growth for global lighting industries by promoting the value of lighting, and by promoting trade practices and healthy regulatory frameworks that stimulate innovation and fair competition. GLA shares information, within the limits of competition law, on political, scientific, business, social and environmental issues of relevance to the lighting industry and advocates the position of the global lighting industry to relevant stakeholders in the international sphere.

Members

- ABILUX (Brazil)
- China Association of Lighting Industry
- Electric Lamp and Component Manufacturers Association (ELCOMA – India)
- Japan Lighting Manufacturers Association
- LightingEurope
- Lighting Council New Zealand
- Middle East Lighting Association
- National Electrical Manufacturers Association (NEMA – USA)
- Taiwan Lighting Fixture Export Association

Recent publications

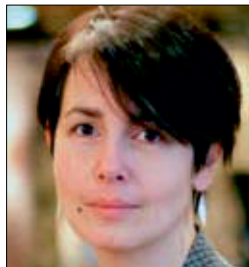
- Position Statement on Germicidal UV-C Irradiation: UV-C Safety Guidelines
- Germicidal UV-C Irradiation: Sources, Products and Applications
- Light at night: the importance of quality lighting and night preservation
- Position Statement on Temporal Light Artefacts
- Strategic Roadmap of the Global Lighting Industry

Website:

www.globallightingassociation.org



Maurice Maes
President,
Global Lighting Association



Ourania Georgoutsakou
Secretary General,
LightingEurope



Shyam Sujan
Secretary General, Electric Lamp
& Component Manufacturers'
Association



Chen Yansheng
Executive Vice President, China
Association of Lighting Industry



Pekka Hakkarainen
Vice President, Lutron Electronics
(representing National Electrical
Manufacturers Association)



Kiyooki Uchihashi
Executive Managing Director, Japan
Lighting Manufacturers Association



Michael Ng
Director, Taiwan Lighting Fixture
Export Association



Gerald Strickland
Secretary General, Middle East
Lighting Association



Bryan Douglas
Secretary General, Global Lighting
Association (representing Lighting
Council Australia)

BUREAU OF ENERGY EFFICIENCY

Ministry of Power, Govt. of India, 4th Floor, Sewa Bhawan, R. K. Puram, New Delhi - 110066 (INDIA)



The Government of India set up Bureau of Energy Efficiency (BEE). on 1st March 2002 under the provisions of the Energy Conservation Act, 2001. The mission of the Bureau of Energy Efficiency is to assist in developing policies and strategies with a thrust on self-regulation and market principles, within the overall framework of the Energy Conservation Act, 2001 with the primary objective of reducing energy intensity of the Indian economy.

Role of BEE

BEE co-ordinates with designated consumers, designated agencies and other organizations and recognize, identify and utilize the existing resources and infrastructure, in performing the functions assigned to it under the Energy Conservation Act. The Energy Conservation Act provides for regulatory and promotional functions.

The Mission

The mission of the Bureau of Energy Efficiency is to develop policy and strategies with a thrust on self-regulation and market principles, within the overall framework of the Energy Conservation Act, 2001 with the primary objective of reducing energy intensity of the Indian economy. This will be achieved with active participation of all stake holders, resulting in accelerated and sustained adoption of energy efficiency in all sectors of the economy.

Objectives of BEE

- To provide policy framework and direction to national energy conservation activities.
- To coordinate policies and programs with stakeholders on efficient use of energy.
- To establishment systems and procedures to measure monitor and verify energy efficiency improvements in individual Sectors as well as at the National level.
- To leverage multi-lateral, bi-lateral and private sector support in implementation of programs and projects on efficient Use of energy and its conservation.
- To coordinate policies and programs on efficient use of energy and its conservation with the involvement Of stakeholders.
- To plan, manage and implement energy conservation programs as envisaged in the Energy Conservation Act.
- To demonstrate energy efficiency delivery mechanism as, envisaged in the Energy Conservation Act, through Private-public partnership.

The Major Promotional Functions of BEE include:

- Create awareness and disseminate information on energy efficiency and conservation
- Arrange and organize training of personnel and specialists in the techniques for efficient use of energy and its conservation
- Strengthen consultancy services in the field of energy conservation
- Promote research and development
- Develop testing and certification procedures and promote testing facilities
- Formulate and facilitate implementation of pilot projects and demonstration projects
- Promote use of energy efficient processes, equipment, devices and systems
- Take steps to encourage preferential treatment for use of energy efficient equipment or appliances
- Promote innovative financing of energy efficiency projects
- Give financial assistance to institutions for promoting efficient use of energy and its conservation
- Prepare educational curriculum on efficient use of energy and its conservation
- Implement international co-operation programmes relating to efficient use of energy and its conservation

INDIAN SOCIETY OF LIGHTING ENGINEERS (ISLE)



A-10 Lajpat Nagar-1, Upper Ground Floor, New Delhi 110 024, Tel: 011 41326950, Email: isleled@vsnl.com, Website: isleind.org

Vision

To establish a neutral fraternity of Lighting professionals to further the cause of lighting development in India for the benefit of its people at large and to put India on par with the global lighting community in terms of its lighting knowledge base and applications.

Mission

A non-profit organisation to bring together all professionals connected with aspects of light and lighting related technology for the upgradation of knowledge and improvement of standards, to facilitate the overall interest of members and enhance skill development, to awaken lighting interest in the students and to create a connectivity with the global lighting knowledge community.

Objectives

- Promoting the art, science and practice of illumination engineering services as associated with built and open environment for the benefit of the public in general.
- Advancing education and research in illumination engineering and publishing useful results of this research.
- Formulating lighting codes, guides and technical reports and publishing them along with newsletters, journals and books on "illumination".
- Maintaining liaison and technical interaction with national / international organisations concerned with matters related to the science technology, standardisation and art in the fields of light and lighting.
- Co-operation with the Bureau of Indian Standards in their standardisation work in the field of lighting.
- Providing guidance to young engineers for career improvement in illumination engineering.
- Organising exhibitions and trade fairs of lighting and allied industries.

Organisation

ISLE State and Local Centres – The ISLE Secretariat is located in Delhi. State Centres are located at Kolkata, Delhi,

Mumbai, Chennai, Bangalore, Jaipur and Indore.

There are Local Centres at Pune, Guwahati, Hyderabad and Bhubaneswar.

ISLE Governing Body

All the countrywide activities of the Society are overseen by a Governing Body through its various Committees and Local Centres. The Governing Body of ISLE comprises the President, Immediate Past- President, Vice-President, Hon. General Secretary, Treasurer, twelve members and one member from each State Centre.

Membership

The members of ISLE are represented on national bodies such as the Development Council of the Ministry of Industry, Confederation of Indian Industry, Bureau of Indian Standards, Bureau of Energy Efficiency and Ministry of Electronics & Information Technology. They are also active participants in industry associations like the Electric Lamp and Component Manufacturers Association of India and the Indian Electrical and Electronic Manufacturers Association. They belong to leading lighting companies and utilities and are associated with research organizations like the National Physical Laboratory, Central Building Research Institute, the Electric Research and Development Association and various universities. They are involved with the Institution of Engineers for seminars and training.

National Affiliations

ISLE has now MOU with CPWD, ASSOCHAM, India Building Congress, Institute of Engineers and number of Engineering Colleges and Universities.

International Affiliations

ISLE has various International Affiliations to work together in exchange of technology innovation and understanding best practices adopted in different countries. It has MOUs with IESNA – Illuminating Engineering Society of North America, ILE – Institution of Lighting Engineers, IESANZ – Illumination Engineering Society of Australia and New Zealand and ISA – International Solid State Lighting Alliance. ISLE holds joint educational programmes with the LRC - Lighting Research Centre (USA). It is a member of Lux Pacifica, a Lighting Body that represents 60% of the world's population.



OVERVIEW

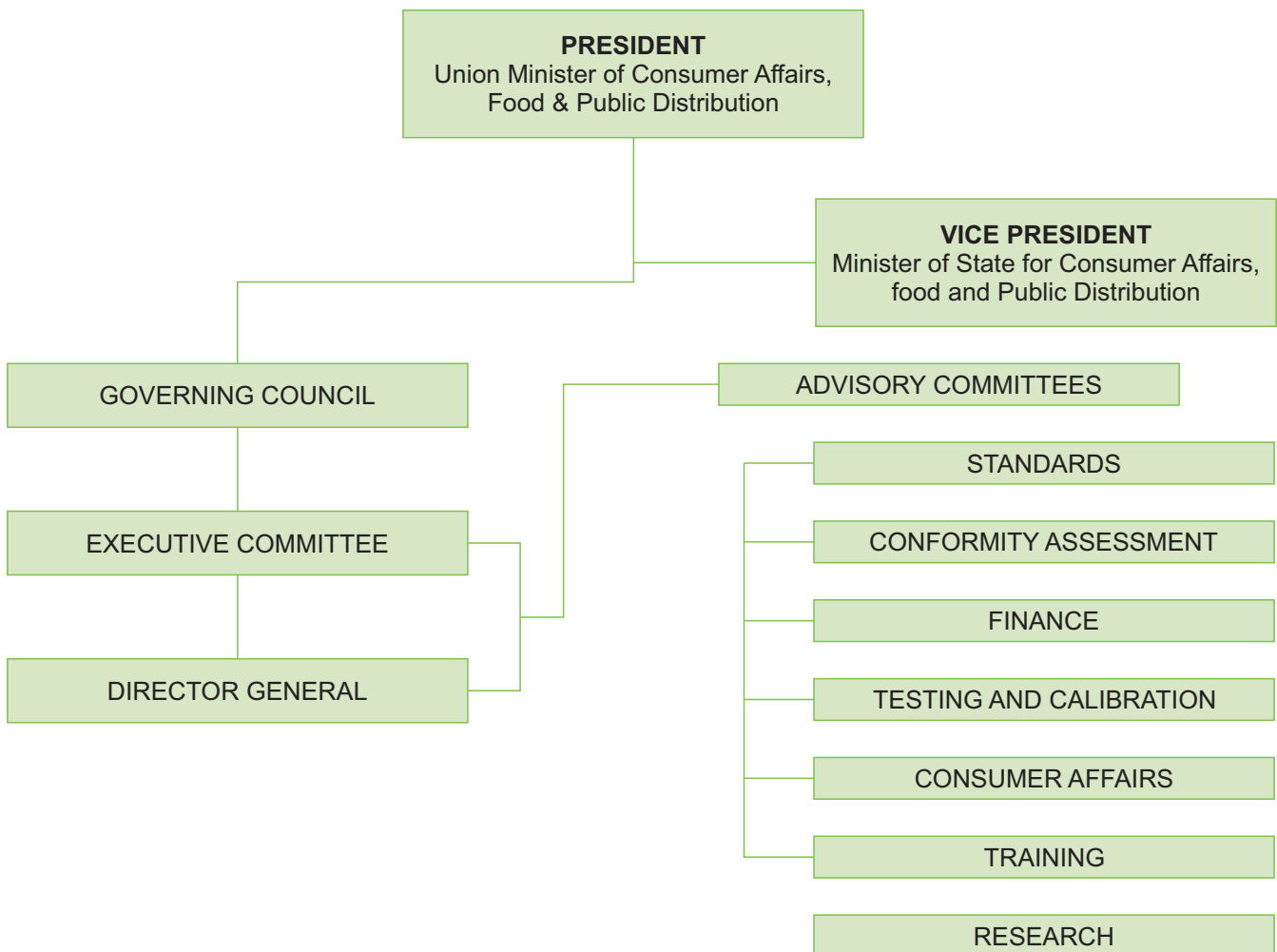
Bureau of Indian Standards (BIS), the National Standards Body of India was established under the BIS Act 1986, assuming the functions of the erstwhile Indian Standards Institution (ISI). BIS Act 2016 came into force on 12 October 2017 superseding BIS Act 1986. BIS Act 2016 provides for the establishment of a national standards body for the harmonious development of the activities of standardization, conformity assessment and quality assurance of goods, articles, processes, systems and services and for matters connected therewith or incidental thereto.

Core Activities of BIS includes Standardization, Product Certification, Registration, Laboratory Services, Hallmarking,

Management Systems Certification, International Activities and Training Services

BIS has its Headquarters at New Delhi. It has 5 Regional Offices (ROs) located at Kolkata (Eastern), Mumbai (Western), Chandigarh (Northern), Chennai (Southern), and Delhi (Central). Under the Regional Offices are the Branch Offices (BOs). There are 41 BOs located at 32 different locations namely Ahmedabad, Bengaluru, Bhubaneswar, Bhopal, Chandigarh, Chennai, Coimbatore, Dehradun, Delhi, Faridabad, Ghaziabad, Guwahati, Hubli, Hyderabad, Jaipur, Jammu, Jamshedpur, Kochi, Kolkata, Lucknow, Madurai, Mumbai, Nagpur, Noida, Panipat, Parwanoo, Patna, Pune, Raipur, Rajkot, Surat and Vishakhapatnam.

STRUCTURE OF BIS



COMPANY PROFILE:

ESTABLISHED: 14th July, 1938

1. Business Domain	Consumer Products (Appliances, Fans, Lighting), Illumination, Engineering & Projects
2. Product Brand	Bajaj, Nirlep, Morphy Richards
3. Manufacturing Facilities	Chakan, Ranjangoan & Shikohabad
4. Products Manufactured	Lighting, Fans, Appliances & High Masts
5. Details of Exports (Products/countries/value etc.)	Lighting (Fans & Appliances) – African countries (Nigeria, Ghana, Gambia, Kenya, etc.), Gulf Countries (UAE, Oman, etc.) & South Asian Countries
6. No. of employees	3007 as on 31st March 2020
7. Directors and their contact details (phone, e-mail, location etc)	1. Mr. Shekhar Bajaj- cmd@bajajelectricals.com 2. Mr. Anuj Poddar- anuj.poddar@bajajelectricals.com
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mr. Mankesh Patkar, Head Marketing CP Mankesh.patkar@bajajelectricals.com & Mr. Rakesh Ramchandran, Head Revenue Illum rakesh.ramachandran@bajajelectricals.com b. Mr. Rakesh Moolchandani, Head Exports rakesh.m@bajajelectricals.com Mr. Lalit Pradhan, Product Head CP Lighting lalit.pradhan@bajajelectricals.com
9. E-mail	lalit.pradhan@bajajelectricals.com

COMPANY PROFILE:

Surya Roshni is a proud Indian Multinational, and one of the leaders in the Indian Lighting market, as well as the largest GI & Hollow Section Pipes manufacturer in India. With an annual turnover of INR 5475 Crores (FY 2019-20), Surya Roshni is one of the largest Indian multinational companies.

Surya's extensive Lighting product range includes LED Lamps, Luminaires, Downlighters and Battens, Street Lights, Poles, High Masts, Conventional lighting (FTL, GLS, HID) and Components. Surya also exports its products to over 45 countries across the globe, including in Europe & America.

Today, Surya is one of the most trusted brands in India, and is registered with various Government departments, institutions and international buyers. In order to deliver on its commitment to world-class quality & environmental consciousness, all of its manufacturing units have obtained ISO 9001:2015, ISO 14001:2015 & IS 18001:2007 certifications. The entire product range is designed in-house at its Noida based R&D Centre, and is tailored to suit Indian conditions and global standards.

The Company has ventured into LED Facade Lighting and Solar Lighting Products to capture emerging opportunities, and has further strengthened its foothold by lighting up Smart Cities, DMRC, Railway Stations, Flyovers and Bridges, Temples, Monuments and Tourist attractions.

ESTABLISHED: 1973

1. Business Domain	Lighting: LED Lamps, Luminaires, Downlighters & Battens; High Mast Lighting Systems, Poles, Lamp Components & Exports
2. Product Brand	SURYA
3. Manufacturing Facilities	Kashipur and Malanpur
4. Products Manufactured	LED Lamps, LED Luminaires, LED Downlighters, LED Battens, Electronic Ballasts, FTL, GLS, Metal Halide, HPSV, HPMV, Components for GLS & FTL
5. Other Products Traded	Luminaires, Poles, High Mast Lighting Systems, LED's and Electronic Lighting Controls
6. Details of Exports	45 Countries, including in Europe and Americas
7. Annual Lighting & Consumer Durables Segment Turnover	INR 1250 crores (FY 2019-20)
8. No. of employees of Company	3500
9. Executive Directors	Mr. J.P. Agarwal - Chairman Mr. Raju Bista - Managing Director Mr. Vinay Surya - Whole Time Director Mr. Kaustubh N Karmarkar - Whole Time Director Mr. Nirupam Sahay – Executive Director & CEO, Lighting
10. Contact Persons for a. Business Development b. Exports c. Luminaire & High Mast d. R&D, Technology	Mr. Vasumitra Pandey, COO, Lighting (vasumitra@surya.in) Mr. Arunabha. Ghosh, Senior GM, Exports (aghosh@surya.in) Mr. Vrajender Sen, President, Professional Lighting (vsen@surya.in) Dr. Amit Tyagi, Head, R&D (amit.tyagi@surya.in)
11. Head/Registered Offices Contact persons	Head Office: Padma Tower-1, 2nd Floor, Rajendra Place, New Delhi-110008. Tel.: 011-47108000/25810093-96. Fax: 011-25789560 Regd. Office: Prakash Nagar, Sankhol, Bahadurgarh, Haryana – 124507, Tel.: 01276-241540-41 Nirupam Sahay, ED & CEO, Lighting (nirupamsahay@surya.in)
12. E-mail	nirupamsahay@surya.in, amit.tyagi@surya.in

COMPANY PROFILE:
ESTABLISHED: 1993

1. Business Domain	Lighting
2. Product Brand	LEDVANCE Luminaires and EC, OSRAM lamps
3. Manufacturing Facilities	Third Party
4. Products Manufactured	Lighting and Lighting Accesories
5. No. of Employees	100
6. Directors and their contact details (phone, e-mail, location etc)	<p>Mr. Krishan Sujan, Managing Director Email: k.sujan@ledvance.com Tel: +91-124-4150100</p> <p>Mr. Rajesh Agarwal, Whole Time Director & CFO Email : r.agarwal@ledvance.com Tel: +91-124-4150100</p>
7. Contact Persons For Business Development	<p>Mr. Abhilash Nair (Marketing) Mr Shashank Choudhary (Institutional Sales) 1201-1202, 12th Floor, Signature Towers, Tower - A, South City-1, Gurgaon-122001, Haryana, Tel: +91-124-4150100</p>
8. Regional Offices- Contact Person / Address	<p>Regional Office (West) Mr. Vinay Bharti (Regional Sales Manager) Ledvance Private Limited B-2056, Oberoi Garden Premises Co-op. Soc. Ltd, Chandivali Farm Road, Chandivali, Andheri East Mumbai –400072, Tel: +91-022-62384800</p> <p>Regional Office (South & East) Mr. Raja Sandar (Regional Sales Manager) Ledvance Private Limited Ground Floor, 204, 27th Cross, 7th Block, Jayanagar Bangalore -560070, Tel: + 91–80–48908652</p> <p>Regional Office (North) Mr. Vinay Bharti (Regional Sales Manager) Ledvance Private Limited 12th Floor, 1201-1202, Signature Towers, Tower - A, South City-1, Gurgaon-122001, Haryana</p>
9. Any other Information	www.ledvance.com
10. E-mail	customercare@ledvance.com



USHA INTERNATIONAL LTD

Plot No. 15, Institutional Area, Sector-32, Gurgaon – 122 001, Haryana

TEL: 9971150841

E-mail: vikas_gandhi@usha.com

COMPANY PROFILE:

ESTABLISHED:

1. Business Domain	Consumer Durables
2. Product Brand	USHA (Lighting Brand : TISVA)
3. Manufacturing Facilities	Hyderabad
4. Products Manufactured	NA
5. Other Products Traded	Cooking & Fabric Care Appliances, Lighting Products, Electric Fans, Room Coolers/Heaters, Water Coolers/Heaters/Dispensers, Sewing Machines, Electric Water Pumps
6. No. of Employees	100
7. Details of Exports (Products/countries/value etc.)	NA
8. Annual Lighting Turnover	NA
9. No. of employees	NA
10. Directors and their contact details (phone, e-mail, location etc)	NA
11. Contact Persons For Business Development	Mr. Vikas Gandhi, Senior Vice President & BU Head, Lighting & Premium Fans Contact Details: Plot No. 15, Institutional Area, Sector-32, Gurgaon – 122 001 Haryana Mobile: 9971150841
12. Regional Offices- Contact Person / Address	NA
13. Any other Information	NA
14. E-mail	vikas_gandhi@usha.com

ACCURATE AND REPRODUCIBLE MEASUREMENTS OF UV RADIATION

This article explains the why and how of UV Radiation measurement

Science was launched by Galileo's call of "Measure, whatever you can measure. If there is something, which cannot yet be measured, find out how it can be measured". In modern day world, accurate measurements are the backbone of new discoveries and most of the Noble prizes in recent years, have gone to Measurement Science. Not only are accurate and precise measurements necessary for quality control and increased productivity but also necessary for the benefit of humanity. Precise and accurate measurements of electromagnetic (EM) radiation in general, are very important for new discoveries in science and technology.

The amount of radiant energy in the optical region, extending from ultraviolet (UV) to infrared (IR) (i.e. 100 nm to 25 μ m of the EM spectrum), has been possible due to significant developments in sources, detectors, measuring instruments and techniques. These improved realizations have largely supported the present day need of measurement of radiant energy very accurately. In particular 'the phototherapy community' engaged in the development of UV sources and detectors in the wake of the present day crisis of COVID-19 for applications, demand improved traceability and reliability of measurements at the level of minimum uncertainty in the measurement of the UV radiation especially UV-C radiation used for dissociation the COVID-19 virus. Therefore, it has become very pertinent to discuss the measurement techniques being followed by NMIs and the Standards Laboratories (such as NPL, New Delhi) in India or worldwide, for providing traceability to the measurements for UV.

The measure of EM radiation is called radiometry while measurement in the visible region of the EM, called light (380 nm to 780 nm) is called photometry. Since UV radiation is between

380 nm and 100 nm, therefore EM radiometry encompasses the measurement of UV radiation.

In general, there are two well-known ways to realize various radiometric units, (i) Source based radiometry (ii) Detector based radiometry. In source-based radiometry source of well-defined radiation such as a blackbody is used as a primary standard, while in detector-based radiometry, self-calibrating or calibrated detectors such as electrical substitution-based radiometers (ESR) used as standard.

UV light covers a wavelength spectrum from 100 to 380 nm and is subdivided into three regions by wavelength: UVA (320 to 400 nm), UVB (280 to 320 nm), and UVC (200 to 280 nm). Among them, UVC has the strongest germicidal effect and is widely used in the form of mercury lamps to inactivate microorganisms. Other phototherapy sources include medium-pressure metal halide lamps (iron or cobalt halides are common). These emit broadly across the UV and visible spectra, so are almost exclusively used with UV filters to shape the output spectrum. The much talked about excimer lamps (krypton chloride lamps) and UV light-emitting diode (UV-LED) technology has been developed recently as an alternative.

ULTRAVIOLET MEASURING EQUIPMENT

Ultraviolet radiometers

Appropriate and suitably calibrated UV radiometers are required to provide accurate, precise and reliable measurement. Radiometers, in general have a silicon photodiode acting as a sensor, that detects spectral response extending over UV, visible light and near -infrared radiation wavelengths. An optical filter is used to separate the UV wavelength range to be measured from any unwanted or out-of-band radiation. With different filters, such radiometers can be made to respond to UVA, UVB or UVC wavelengths. Practically, it is very difficult to achieve spectral responses that cut off sharply at exact wavelengths, therefore, tail off at either end of the range and correction for the same must be adopted.

UV radiometer with approximately matching spectral responses should be selected before employing them into measurements.



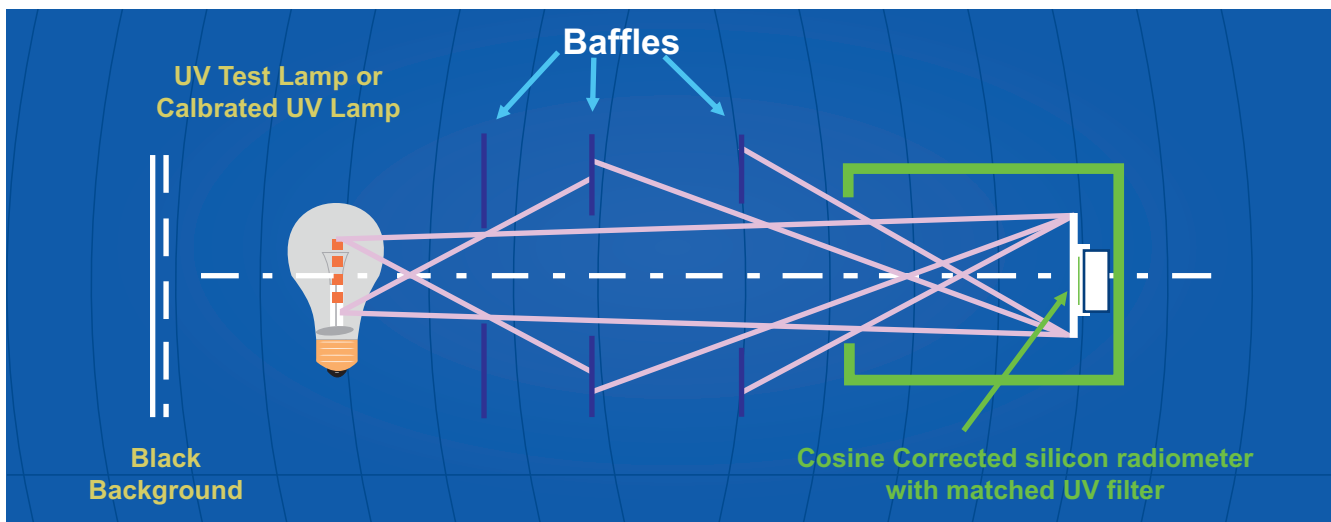


Fig. Experimental set up for UV measurement/ calibration

A special example of a filter-modified response is that of a radiometer with a net spectral response mimicking the hazard-weighted action spectrum. This can be achieved with a vacuum photodiode sensor and a matched filter. Such radiometers can be calibrated to indicate directly hazard-weighted irradiances with acceptable accuracy, irrespective of the exact emission spectra of the UV source. This can help assessment of occupational UV exposures.

Other most important features of the UV radiometer is that its response must vary as the cosine of the angle of incidence of UV rays called the 'cosine response', which can be approximated by fitting an optical diffuser as the front element of the UV radiometer. A deviation from the cosine response is described as *f* error (significant deviation in *f*, i.e. if $f \geq 5\%$ this error results in erroneous values). Correction for this error is to be done before assigning a value to the measurement UV irradiance. The radiometer should have a linear response (deviation < 2% or better) over a large dynamic range of intensities (~ 0.001–50.0 mWcm⁻²) with a display unit to have digital resolution of ±0.001 mW cm⁻² (for adequate numerical precision).

The calibration of a radiometer would involve a comparison of the electrical signal produced by the UV radiometer under calibration for irradiance or spectral irradiance with the electrical signal produced by a standard detector which must be a calibrated UV radiometer for irradiance or spectral irradiance by an NMI or a self-calibrating detector namely ESR for spectral irradiance for the UV range of interest. The ratio of the electrical signals so achieved multiplied by the calibrated irradiance with estimation of uncertainty in measurement by identifying the possible factors contributing to uncertainty can be used for

calibration of the detectors in an accurate manner.

Spectroradiometers

In some cases the irradiance measurement at several components of each wave band is required and the measurement are called spectral irradiance measurement, which is expressed in radiometric units such as $\mu\text{W cm}^{-2} \text{ nm}^{-1}$. For this purpose spectroradiometers, in general, two types of spectroradiometers, namely a scanning spectroradiometer (SSR) or charge-coupled device (CCD) array are employed. In an SSR the input optics gather radiation from a specific radiation. A cosine diffuser on the input is required if the spectroradiometer is to measure irradiance at a surface, that would be received by the skin from a phototherapy lamp. One of the most important component of the spectroradiometer is a monochromator which consists of a finely etched or a holographic diffraction grating of printed parallel lines that produce a wavelength-dependent angular dispersion of light. Light entering through an input slit of the monochromator is collimated by a collimator (generally, a concave grating and the input slit at the focus of the mirror) made incident onto the diffraction grating. The grating is rotated to scan the separated spectrum across an exit slit (whose opening is usually equal to that of input slit to define a small range of wavelengths), delivers a small range of wavelengths from the monochromator to the detector. As stray light can introduce significant measurement errors in phototherapy applications, double monochromator spectroradiometers (a combination of prism and grating) are typically recommended where accurate measurements are required. Stray-light rejection factors (the ratio of stray to incident light) up to 10⁻⁶ are achievable with double

monochromator systems – some three orders of magnitude better than single monochromators.

A CCD arrays spectroradiometer, unlike SSR, consists of the monochromator having a compact static grating with a CCD array (single-line or two-dimensional array) as a detector. Therefore, it is used to provide fast and are suitable for field-based measurements, where simultaneous and real-time whole spectrum measurements are required. In such spectroradiometers, input optics comprising of an optical fibre with a cosine-corrected diffuser, for accurate measurements of UV radiation from phototherapy lamps at the other end of the fibre, is essential. Each array of the CCD must be calibrated for wavelength using low pressure atomic discharge lamps, namely low pressure mercury argon, cadmium and or zinc lamps. Resolution of wavelength depends on the number, size and separation of the CCD arrays, the grating characteristics and the optical geometry. This arrangement captures of the whole spectrum simultaneously. An added advantage of a CCD spectroradiometers utilizing two-dimensional arrays is its use as imaging spectroradiometer. CCD arrays are relatively cheap and are easy to use in the field but the disadvantage is that they suffer from high levels of stray light, however, with the same level of precautions and care in terms of calibration and conditions of use as applied to the traditional SSRs, accurate measurements can be performed.

CALIBRATION AND TRACEABILITY OF MEASUREMENTS.

A well-characterized source of light with known spectral irradiance, i.e. a lamp that has been calibrated at the NPL, India or any NMI of any country referred as the transfer standard, must



be employed for accurate calibration of spectroradiometers. When the calibration is to be carried out by a calibration laboratory, replication of the distance from a spectroradiometer and orientation of the lamps with other environmental conditions maintained at the NPL or the NMI are a must, to get accurate and reproducible results. The calibration laboratory is recommended to procure at least one other similar lamp and a second lamp of a different type, for example a tungsten filament lamp and a deuterium lamp, which works as a secondary transfer standard for internal quality control checks. The spectroradiometer should be calibrated either each time it is used or on a regular basis, with checks carried out in between. Typically, deuterium and/or tungsten lamps should be used with stabilized power supplies.

Uncertainty of the reference detector is slightly less than that of the calibration lamp but the final overall uncertainty of the UV detector calibrated by either method as described above (marked in italics) is very similar. Inter-comparisons between two or more accredited laboratories following ISO/IEC 17025:2017, one using a lamp-based calibration and the other detector-based, would show good agreement within the state of art value agreed internationally.

Ultraviolet (UV) irradiance measurements are usually associated with large inaccuracies and uncertainties. Therefore, comparability of corresponding measurement equipment and its data are quite cumbersome and complicated. For supervisors or safety experts, it should be made mandatory to measure reliable UV irradiances with regard to occupational safety regulations. To make life easy, measurements of two UV irradiance standards, a deuterium and a halogen lamp, must be carried out. The percentage deviations of the measured total UV irradiances from their calibrated counterparts should be well within the internationally agreed values. The quality of wavelength accuracy as well as of the spectral bandwidth, both investigated by means of a low pressure mercury argon lamp provide consistent results. As a follow up, UV radiation from the UV lamp must be examined at two/three distances to check the behaviour of UV irradiance accuracy in the field measurements. The overall averaged standard deviation of these field measurements for all CCD array detectors must be stated for transparency and quality.

**AUTHOR : DR. H.C. KANDPAL, FNASc AND
DR. J.K JAIN, CMD,
FIEM INDUSTRIES LTD**

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

COMPANY PROFILE:

Crompton Lighting caters to a wide range of products in Home, Retail, Commercial, Industrial, Infrastructure and Smart Street Lighting Solutions.

ESTABLISHED:

1. Business Domain	Integrated Lighting Product Manufacturer
2. Product Brand	CROMPTON
3. Manufacturing Facilities	Vadodara and Baddi
4. Products Manufactured	LED, Conventional Lighting Controls and Solar Lighting Products for B2B and B2C segment
5. Details of Exports (Products/countries/value etc.)	Sri Lanka, Nepal, Bangladesh, Africa and Singapore
6. Directors and their contact details (phone, e-mail, location etc)	Mr. Shantanu Khosla, Managing Director
7. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Hemant Khattar Associate Vice President b. Kishor Aher Vice President - Export c. Mukund Amin Deputy General Manager - Engineering
8. Regional Offices – Contact person / address	North: Mr. Himadri Choudhary Address: CGCEL, 3RCC Floor, Express Building, Near ITO Crossing, New Delhi – 110 001 E-mail: himadri.choudhury@crompton.co.in East: Mr. Sibabrata Baral Address: CGCEL, 1st Floor, 50, Chowringhee Road, Near IISCO House, Kolkata – 700 071 E-mail: sibabrata.baral@crompton.co.in West: Mr. Praveen Kumar Satuluri Address: CGCEL, 302, 3rd Floor, Business Square, A wing, Chakala, Mumbai – 400 093 E-mail: praveen.satuluri@crompton.co.in South: Mr. Nageswara Rao Nalam Address: CGCEL, Crompton House, No. 3, Dr. M.G.R. Salai, Kodambakkam High Road, P.B. NO. 3316, Nungambakkam, Chennai – 600 034 E-mail: nageswara.nalam@crompton.co.in
9. E-mail	vishal.kaul@crompton.co.in

COMPANY PROFILE:

ESTABLISHED: 1989

1. Business Domain	Manufacturing of Automotive Components, LED Luminaires and IPIS Systems
2. Product Brand	FIEM
3. Manufacturing Facilities	Total 9 Manufacturing facilities spread across India: Kundli & Rai (Haryana), Tapukara (Rajasthan), Nalagarh (Himachal Pradesh), Mysore (Karnataka), Hosur (Tamil Nadu) & Ahmedabad (Gujarat)
4. Products Manufactured	Automotive Lamps & Signalling Equipments, Rear View Mirrors, Plastic Moulded Parts, Sheet Metal Components, Canister, Bank Angle Sensors, Fuel Pump Modules, LED Luminaires and IPIS Systems.
5. Details of Exports (Products/countries/value etc.)	Europe, Japan, USA, Nepal, Thailand, Italy, Srilanka, Austria, Indonesia, Germany etc.
6. No. of employees	More than 2200
7. Directors and their contact details (phone, e-mail, location etc)	Mr. J.K. Jain, CMD Mr. Rahul Jain, Director Mr. Rajesh Sharma, Director
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	As above
9. Regional Offices – Contact person / address	As above
10. Any other information	With a history of 40 years, Company is leading Tier-1 Supplier to OEMs in India and abroad, and one the leaders in Automotive lighting in two-wheelers.
11. E-mail	cmdoffice@fiemindustries.com

COMPANY PROFILE:

OSRAM Head Office based in Munich (Germany) is a leading global high-tech lighting company with a history dating back more than 113 years. Primarily focused on semiconductor-based technologies, our products are used in highly diverse applications ranging from virtual reality to autonomous driving and from smartphones to smart & connected lighting solutions in buildings and cities. OSRAM uses the endless possibilities of light to improve the quality of life for individuals and communities.

OSRAM in India is one of the premier and leading lighting technology company. The operating activities covered by our business model are organized into three Business Units:

Automotive, Opto Semiconductors & Digital.

The **Digital** business unit bundles OSRAM's businesses that benefit most from the ongoing digitalization process. These range from electronic components and lighting systems to hardware and software for lighting management. Through smart connected lighting infrastructure, we are enabling our customers to gain access to digital solutions in a connected world. The solution cover luminaires, control, system and beyond lighting. Our continuous innovation, customization and service create value for customers around the world. With our leading brand OSRAM, we can meet all different needs from customers and provide advanced, smart and flexible solution and service to help customers be energy efficient and sustainable.

The **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 we develop and markets intelligent lighting solutions for automotive applications, such as intelligent matrix light for headlamps.

OSRAM **Opto Semiconductors** offers a spectrum of infinite possibilities of high-quality products in the field of illumination, visualization and sensor technology. Our extensive technological know-how and our passion for innovation make us a global leader in the field of optical semiconductors.

ESTABLISHED:

1. Business Domain	Lighting
2. Product Brand	OSRAM
3. Manufacturing Facilities	23 factories in 9 countries worldwide
4. Other Products Traded	Automotive Lighting, LED Drivers and modules, Luminaires, Controls, Opto semiconductors, UV-C lights, Medical Lights, Airport Lights, Horticulture lights and Smart textile lights
5. No of Employees	Till last fiscal year (30th of Sep. 2019) - 23,500 employees in over 120 countries worldwide
6. Directors and their Contact Details (India)	Avinder Singh , CEO, OSRAM Lighting Private Limited, India
7. Contact Person for a. Business Development	Deepanjan Gupta, Deepanjan.Gupta@osram.com Nitit Saxena, N.Saxena@osram.com
8. Regional Offices - Contact details	India Head Office: C/O Surinder Jakhar Bhavan, 1st Floor, Plot No 3, Sector -32, Gurugram-122001, Haryana- India Tel-124-6261300 Regional Office West: A WING 503, CITY POINT COMMERCIAL COMPLEX, ANDHERI-KURLA ROAD, ANDHERI (East), MUMBAI400 059.Tel-+912261401300 Regional Office South: Prestige Pinnacle ,N.113, 1st floor, 7th Block, Kormangala Industrial Estate-Bangalore -560095, Tel- +918046462000



SIGNIFY INNOVATIONS INDIA LIMITED

REGISTERED OFFICE- Mangalam business centre, block-b, 6th floor, 22,
camac street, kolkata – 700016, Tel: +91 1246635555
E-mail: support.philipslightingindia@signify.com

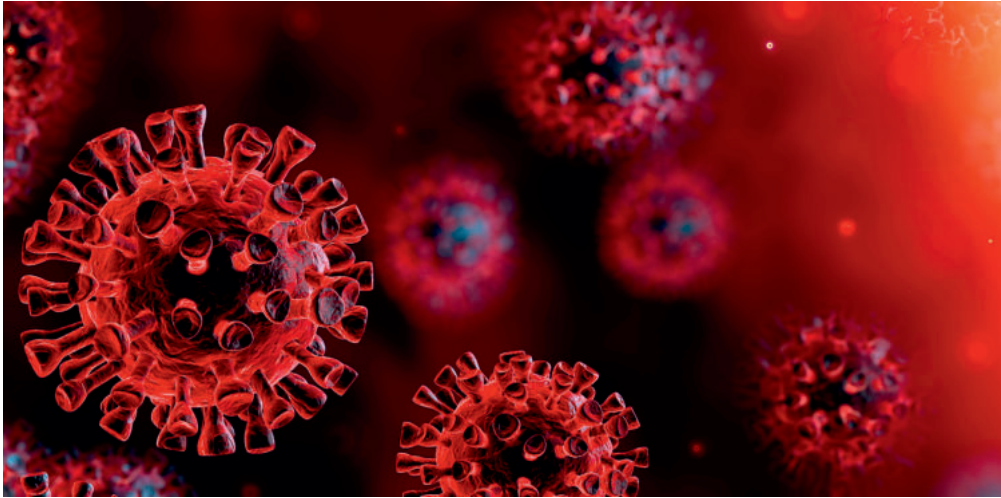
COMPANY PROFILE:

ESTABLISHED:

1. Business Domain	Lighting, Switches & Switch Gear, Fans
2. Product Brand	PHILIPS, EcoLink, interact, Color Kinetics, PHILIPS hue, Modular Lighting - Instrument, Luce Plan
3. Manufacturing Facilities	Vadodara Factory
4. Products Manufactured	LED Lamps, LED Luminaires, Solar LED Lighting Systems, Lighting Controls, Connected Lighting Products, Horticulture Lighting Products, Conventional Lamps & Luminaires, Electrical Switches & Switch Gears, Fans
5. Annual Lighting Turnover	Approx. 3000 Crores
6. No. of employees	As on 31st March'2020- 2132
7. Directors and their contact details (phone, e-mail, location etc)	Mr. Mahesh Srinivasan Iyer Mr. Sumit Padmakar Joshi Ms. Sangeeta Pedurkar Mr. Sukanto Aich Mr. Vinayak K. Deshpande
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	Regional Marketing Manager- Lighting, Signify Innovations India Limited (Formerly 'Philips Lighting India Limited'), 9th Floor, DLF Tower 9-B, DLF Cyber City, Sector 25, DLF Phase -3, Gurgaon -122002, India Tel: 000 800 050 7777* (*international toll free number) (Monday to Saturday 09:00 - 18:00)
9. Regional Offices – Contact person / address	<p>Gurgaon (Northern Regional Office) Regional Marketing Manager- Lighting, Signify Innovations India Limited (Formerly 'Philips Lighting India Limited'), 9th Floor, DLF Tower 9-B, DLF Cyber City, Sector 25, DLF Phase -3, Gurgaon -122002, India.</p> <p>Kolkata (Eastern Regional Office) Regional Marketing Manager - Lighting, Signify Innovations India Limited, (Formerly Philips Lighting India Limited), Mangalam Business Center, Block B, 6th Floor 22, Camac Street, Kolkata, West Bengal – 700016, India, Telephone: +91 - 33 - 24867621</p> <p>Bangalore Regional Marketing Manager - Lighting Signify Innovations India Limited (Formerly 'Philips Lighting India Limited'), Signify Innovation Campus 5th floor, B wing, Green Heart Building - MFAR, MMTP Phase IV - Manyata Tech Park Nagavara, Bangalore - 560045, India, Telephone: +91 - 80 - 41890000</p> <p>Chennai (Southern Regional Office) Regional Marketing Manager - Lighting, Signify Innovations India Limited, (Formerly 'Philips Lighting India Limited'), Sunny Side , Block C , 3rd Floor, No , 8/17 , 2nd Street , Shafee Mohammed Road, Greams Road, Chennai, Tamil Nadu- 600006, India Telephone: +91 - 44 - 66501000</p> <p>Noida Signify Innovations India Limited, (Formerly 'Philips Lighting India Limited'), C-46, 47, Sector 57 , Noida, Uttar Pradesh, 201301, India, Telephone: +91 - 40 - 66467676</p> <p>Mumbai (Western Regional Office) Regional Marketing Manager - Lighting Signify Innovations India Limited (Formerly 'Philips Lighting India Limited'), Boomerang, B2 Wing, 5th Floor, Unit No. 506, Chandivali Farm Road, Near Chandivali Studio, Andheri (East), Mumbai- 400072, India. Telephone: +91- 22 - 62443000</p>
10. E-mail	support.philipslightingindia@signify.com

GERMICIDAL UVC DOSE FOR DISINFECTION

An in-depth look at the right dosage for UV Disinfection



capability and are destroyed, rendering them inactive and no longer harmful. The germicidal nature of UV is well suited to treat microorganisms which become extremely resistant to chemical disinfectants, as they are unable to develop immunity to UV radiation.

UV light is a component of sunlight that falls in the region between visible light and X-rays on the electromagnetic spectrum, with a wavelength range of 100-400 nanometers (nm). This light can be further categorized into

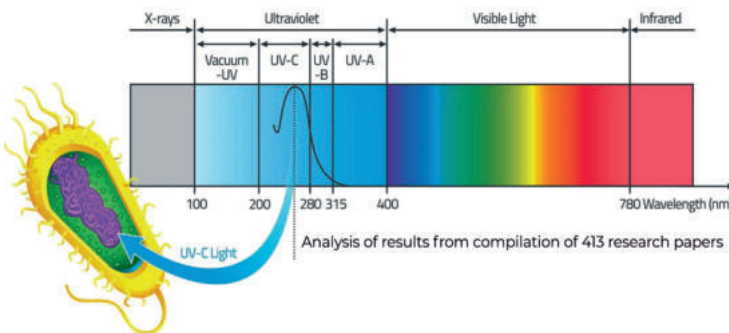
- UVA : 315—400 nm
- UVB : 280—315 nm
- UVC : 200—280 nm
- Far UV (or “vacuum”): 100—200 nm
- How Does Germicidal UV Work?
- Radiation in the UVC range of 250-280 nm deactivates bacteria, viruses, and other microbes by attacking their DNA. UVC light is able to penetrate the cells of microorganisms and disrupt the structure of the DNA molecules. It does this by destroying the genetic information inside the DNA. The microorganisms, in turn, lose their reproductive

- What is a UV Dose?
- Different pathogens have

unique resistances to UV light—some are very susceptible, while others require more UVC exposure for complete inactivation. A correct UV dose is critical to thoroughly deactivate the intended microbes.

- UV dose, also called UV fluence, is calculated using the following equation
- $UV\ Dose = UV\ Intensity\ (I) \times Exposure\ time\ (t)$
- In other words $UV\ Dose = I \times t$,
- where UV dose is measured in joules per meter square (J/m^2) or millijoules per centimeter square (mJ/cm^2).
- UV Intensity (also called UV irradiance) is measured in milliwatts per centimetre square (mW/cm^2)
- Exposure time is measured in seconds
- What is Log Reduction?
- The predictable amount of dosage required for a specific degree of disinfection is referred to as a “log reduction” (i.e. logarithmic reduction). Log reduction relates to the percentage of microorganisms physically removed or inactivated by a given process. For example, a 1 log reduction will see the pathogen of interest reduced by 90% from the influent level before UV disinfection. The microbe count is reduced by a factor of 10—or 1 log. Thus, a 2 log reduction will see a 99% reduction, or microbe reduction by a factor of 100,

UVC FLUENCE (DOSE) RECOMMENDED FOR DISINFECTION



Log Reduction	Reduction Factor	% Reduced
1	10	90%
2	100	99%
3	1000	99.9%
4	10,000	99.99%
5	100,000	99.999%
6	1,000,000	99.9999%

and so on.

- UV Dose Response
- The UV dose-response relationship determines what proportion of a specific microorganism is destroyed after a particular dose of UV radiation. This figure can be expressed as either the proportion of microorganisms inactivated or the proportion remaining as a function of UV dose.
- The UV dose-response is calculated using the following equation:
- $\text{Log inactivation} = \log_{10} (N_0/N)$ Where:
- N_0 = concentration of infectious microorganisms before exposure to UV light
- N = concentration of infectious microorganisms after exposure to UV light

- Ultraviolet Susceptibility of pathogen and viruses
- In a published report by Purplesun it is mentioned that the range of D90 values (UV dosage for 90% inactivation) for coronaviruses is 7-241 J/m², the mean of which is 67J/m², should adequately represent the ultraviolet susceptibility of the SARS-CoV-2(Covid19) virus. As per the data provided 241 J/m² is the max D90 dosage needed for any type of corona viruses clinically known.
- In a recent communication published by Signify, a study by Boston University validated the effectiveness of Signify's UV light sources on inactivating the virus that causes COVID-19. As per this report, the dosage recommended for SARS-CoV-2 for 99% deactivation is 5mJ/cm² and dosage of 22mJ/cm² will lead to 6 log reduction.
- Numerous reports have been published on bacteria and pathogens mentioning the required amount of D90 dosage. It has been seen and inferred that if we can ensure the worst case dosage (from the table) as 241J/m², it can kill most of the corona viruses and bacteria.

**AUTHOR : SANTOSH AGNIHOTRI,
D.G.M / HEAD- QUALITY & TECHNICAL
AND SOURISH DE, HEAD- R&D,
ORIENT ELECTRIC LIMITED**

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

Table 1: Summary of Ultraviolet Studies on Coronaviruses

MICROBE	D ₉₀ DOSE j/m ²	UV K m ² /j	BASE PAIRS KB	SOURCE
Coronavirus	7	0.35120	30741	Walker 2007 ^a
Berne Virus (Coronaviridae)	7	0.32100	28480	Weiss 1986
Murine Coronavirus (MHV)	15	0.15351	31335	Hirano 1978
Canine Coronavirus (CCV)	29	0.08079	29278	Saknimit 1988 ^b
Murine Coronavirus (MHV)	29	0.08079	31335	Saknimit 1988 ^b
SARS Coronavirus CoV-P6	40	0.05750	29829	Duan 2003 ^c
Murine Coronavirus (MHV)	103	0.02240	31335	Liu 2003
SARS Coronavirus (Hanoi)	134	0.01720	29751	Kariwa 2004 ^d
SARS Coronavirus (Urbani)	241	0.00955	29751	Darnell 2004
Average	67	0.03433		

^a(jingwen 2020)

^b(estimated)

^c(mean estimate)

^d(at 3 logs)

References:

GLA Position Statement on Germicidal UV-C Irradiation – UV-C SAFETY GUIDELINES, <https://www.globallightingassociation.org>
Research@purplesun.com, www.signify.com

COMPANY PROFILE:
About Panasonic Life Solutions India Pvt.Ltd.

Established in 1963, Panasonic Life Solutions India (formerly known as Anchor Electricals), is a wholly owned subsidiary of Panasonic Corporation. With a constantly expanding product range and growing market share, it is one of the leading manufacturers of electrical construction materials with presence across India. Its sales and operating profit are steadily growing and it concluded the last financial year with net sales of nearly INR 34 billion. Being a prominent player in the Indian electrical segment the company has about 35 domestic offices and 9500 employees.

Currently, the company's 7 manufacturing units at 4 locations in India are manufacturing electrical appliances products, synonymous with quality. The company offers a wide spectrum of electrical solutions in consumer products ranging from Wires & Cables, Lighting, Solar power, Wiring Devices, Switchgears, Infrastructure, and Indoor Air Quality (IAQ).

Website: <https://sin.panasonic.com/>

Lighting details:

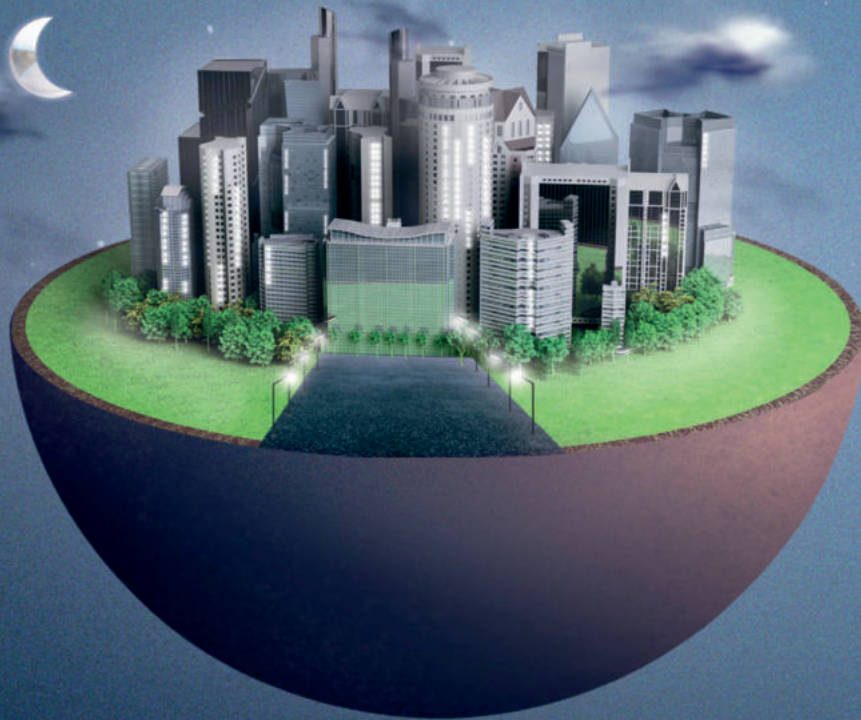
For over 60 years, Panasonic has continued to create advanced lighting products using top-notch designs and technology, quality methods for different spaces. Today, Panasonic enjoys a proven track record as a trusted and preferred brand of choice for lighting products in Japan. Panasonic with its aesthetic range of LED lighting will continue to achieve greater energy savings while enriching the living of several spaces and urban environments across the world. Panasonic Life Solutions presents an exclusive array of LED lights for home – panel lights, downlights, Bulb, Battens, ceiling lights, spotlights, Strip lights, etc. They are elegant, affordable and super energy efficient. In addition to this, we also provide assistance through our lighting design support and unique technology and technical tools. We offer solutions that balance out the customer's business success and environment & social sustainability. In addition to this, we offer varied applications such as planning and designing, testing, on-site validation, design and implementation, and validation after the completion.

At Panasonic Life Solutions, they offer a complete range of energy-efficient and smart lighting products, right from Indoor, Commercial, Industrial, Outdoor, Retail, and Hospitality segment.

ESTABLISHED:

1. Business Domain	Electricals, Manufacturing, ECM Business
2. Product Brand	Panasonic and Anchor
3. Manufacturing Facilities	8 manufacturing locations
4. Products Manufactured	Switches & Accessories, Wires & Cables and Insulation Tapes, Switchgear & Protection Devices, Lighting & Luminaries, Fans and IAQ (Indoor Air Quality), Solar HIT Photovoltaic Modules, Solar Rooftop, Power tools, IoT devices and Home Automation.
5. No. of employees	9000 employees
6. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	Mr. Raja Mukherjee BU Head – Lighting Business Unit Mobile 9958494448
7. Regional Offices – Contact person / address (Secondary)	Mr.Rohit Patel AGM Lighting BU (Sourcing) Mobile 9833808563
8. E-mail	Raja.Mukherjee@in.Panasonic.com, Rohit.patel@in.Panasonic.com

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FIXTURES



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STREET LIGHTS



FLOOD LIGHTS



HIGHBAYS



SUSPENDED DOWNLIGHT



POST TOP

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Registered Office: 12th Floor, Ambience Tower, Ambience Island, NH-48, Gurugram - 122 002, Haryana.



HPL ELECTRIC & POWER LTD

Windsor Business Park, B-1D, Sector 10, Noida, Uttar Pradesh-201301

Tel: +91-120-4656300, Fax: +91-11-23232639

E-mail: gautamseth@hplindia.com, rishiseth@hplindia.com

COMPANY PROFILE:

HPL Electric & Power Limited is a multi-product electric equipment company in the electrical equipment industry. The Company has always believed in being technically abreast and keeping focus on the design and development of products. HPL has two R&D centers, with over 100+ engineers for designing & development modern products. The R&D Centers are approved by the Department of Scientific and industrial Research, Ministry of Science and Technology, Government of India. HPL's product range is divided into four verticals - Metering Solutions, Switchgears, LED Lighting and Wire & Cables.

ESTABLISHED:

1. Business Domain	Electric Equipment Manufacturing
2. Product Brand	HPL
3. Manufacturing Facilities	HPL has 7 Manufacturing facilities, located at Gurgaon, Kundli, Sonapat, Gharaunda in Haryana and Jabli Himachal Pradesh. Facilities are ISO 9001 certified and are well equipped with latest technology to manufacture products conforming to the Indian & International standards.
4. Products Manufactured	LED Lighting equipment's, Metering Solutions, Switchgear, Modular Switches, Wire & Cables and Solar solutions
5. Details of Exports (Products/countries/value etc.)	Exports in more than 40+ countries. SAARC, Africa, Middle east, Gulf and Far East Countries.
6. No. of employees	1200+
7. Directors and their contact details (phone, e-mail, location etc)	1. Mr. Rishi Seth (MD) 2. Mr. Gautam Seth (JMD)
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mr. Rishi Seth (MD) b. Mr. Gautam Seth (JMD)
9. Regional Offices – Contact person / address	North: Windsor Business park, B-1D Sector 10, Noida Uttar Pradesh-201301 East: 69, Ganesh Chandra Avenue, India House, 7th Floor, Block-C, Kolkata - 700 013 West: 2C/H, Rushabh Chambers 2nd Floor, Off-Makwana Road, Near Rubi Hotel Marol, Andheri East Mumbai - 400 059 South: "Amar Sindur" S-4, 2nd Floor, No.-43, Pantheon Road, Egmore, Chennai-600 008
10. E-mail	gautamseth@hplindia.com, rishiseth@hplindia.com



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low on maintenance & 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



long life



ECO light
solution



maintenance free



compact & sleek
design



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HEAT
generation



energy
saver

HPL Electric & Power Ltd

Ph.: +91-120-4656300 | Customer Care No. 1800 419 0198

hpl@hplindia.com

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LUMINOUS POWER TECHNOLOGIES PVT. LTD

Plot No. 150, Sector 44, Gurgaon 122003, India

TEL: +91 124 4776700, FAX: +91 124 2544170

E-mail: connect@luminousindia.com

COMPANY PROFILE:

Luminous Power Technologies is a powerful and trustworthy Brand with a wide range of innovative products in the Power-backup, Home Electrical and Residential Solar space that covers Inverters Batteries, Solar solutions to Home Electrical offerings such as Fans, Modular Switches and Led Lighting.

With 7 manufacturing units, more than 28 sales offices in India and presence in over 36 countries, our 6000 employees serve more than 60,000 channel partners and millions of customers. Our motto has always been customer delight through innovation & passion with the focus on execution & team-work. At luminous, we passionately innovate to make life comfortable and efficient.

ESTABLISHED:

1. Business Domain	Lighting
2. Product Brand	Luminous
3. Manufacturing Facilities	Gagret, Baddi, Hosur
4. Products Manufactured	Battery, Inverters, Fans, Wiring Devices, Solar Inverters
5. Other Products Traded	Lighting, Solar retail, UPS, Auto battery, Stabilizer
6. Details of Exports (Products/countries/value etc.)	Over 36 countries in South Asia, Asia Pacific, Middle east and Africa.
7. No. of employees	6000
8. Directors and their contact details (phone, e-mail, location etc)	Vipul Sabharwal Email: vipul.sabharwal@luminousindia.com Ph: +91 124 4776895 Address: Plot No. 150, Sector 44, Gurgaon 122003, India
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Jitendra Agrawal Sr. Vice President Head Home Electric Business jitendra.agrawal@luminousindia.com Phone: +91 124 4776700 Fax: +91 124 2544170 Address: Plot No. 150, Sector 44, Gurgaon 122003, India b. Mr. Sanjeev Chauhan VP – Sales sanjeev.chauhan1@luminousindia.com Ph: +91 124 4776763 Address: Plot No. 150, Sector 44, Gurgaon 122003, India c. Mr. Naveen Saxena AVP – Head International Business naveen.saxena@luminous-global.com Ph: +91 124 4776764, Handphone : + 91 9810982210 Address: Plot No. 150, Sector 44, Gurgaon 122003, India
10. Regional Offices – Contact person / address	Kolkata: LUMINOUS POWER TECHNOLOGIES PVT LTD.15, Apeejay House, BLOCK-C, Ground Floor, Park Street, Kolkata -700016. West Bengal Pune: LUMINOUS POWER TECHNOLOGIES PVT LTD. 38/4,2nd Floor Krishna Complex, Above Nishan Showroom, Kharadi, Pune 411014 Maharashtra Bangalore: LUMINOUS POWER TECHNOLOGIES PVT LTD.Plot No. 2, Honeydewwz Mansion, 14th Main, 17th Cross, Sector-7, HSR Layout, Bangalore-560102- Karnataka Lucknow: LUMINOUS POWER TECHNOLOGIES PVT LTD 204, Ratan Square, Vidhan Sabha Marg, Lucknow-226001, Uttar Pradesh Ludhiana: LUMINOUS POWER TECHNOLOGIES PVT LTC Unit No-FUF4 4th Floor, Kunal Tower, Mall Road, Ludhiana-141001(PB).
11. E-mail	connect@luminousindia.com

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HUMAN CENTRIC LIGHTING- LIGHT AND HUMAN BIOLOGY

A scientific look at how light impacts our life

Like air to breathe or food to eat, light is also essential for human existence. It plays a much larger part in our lives than one can imagine. Light not only helps us to see and perceive the world around us, but it also effects our emotional and biological aspects, helping us to function and feel better.

One might wonder how can light effect human beings so deeply. For this, we need to understand the relationship between lighting and the visual performance and comfort, it is also necessary to understand the working of the human eye.

The human eye is roughly spherical in shape. Six positioning muscles allow it to swivel in any direction. Our eye functions in roughly the same way as a traditional camera with a lens that projects an inverted image of the scene onto a light-sensitive inner film. In the eye, this film is replaced by the retina and consists of light-sensitive nerve endings. Here the light is transformed via a (photo) chemical process into an electric current and transmitted through the nerves into the brain that interprets it as visual information. The retina is the start of the nervous system leading into the brain. It consists of more than a hundred million light-sensitive nerve endings of two types, which because of their shape, are called 'rods' and 'cones'. The rods and cones connect to the brain via ganglion cells and nerve fibres.

The unique properties of the eye - sensitivity over an enormous lighting-level and the ability to distinguish between up to thousands of colors - are obtained between the highly specialized cones and rods. The rods are highly light-sensitive

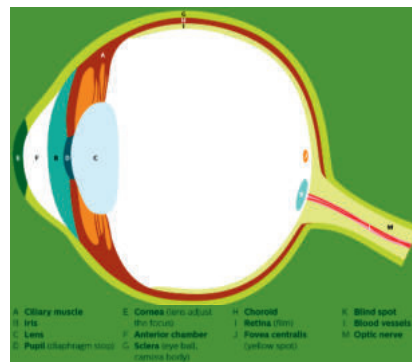


Figure 1 : Cross Section of Eye'

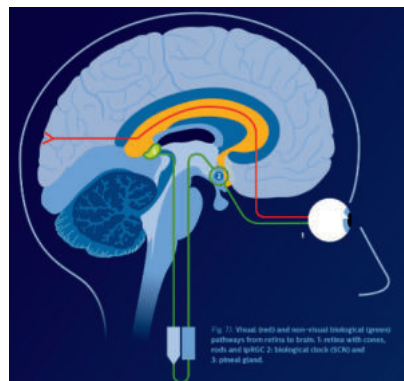


Figure 2: Visual (red) and non-visual biological (green) pathways from retina to brain. 1. Retina with cones, rods and ipRGC. 2. Biological clock (SCN) and 3. pineal gland'

and are principally responsible for the detection of rough shapes and movement but cannot distinguish colors. Cones, on the other hand, are less sensitive to light, but can distinguish colors. They also enable us to see fine detail.

At very low lighting levels (less than moonlight) the sensitivity of the cones is so low that they do not function. Vision is then by rods only and is termed scotopic vision. The cones take over completely at lighting levels greater than some 3cd/m^2 (somewhat brighter than a lit motorway). This vision is then known as photopic vision.

Along with rods and cones cells, our eyes also have a third type of photoreceptor cell called the intrinsic photo sensitive Retinal Ganglion Cell, or ipRG. These cells have a nerve connection to the biological clock located in the brain (also called the suprachiasmatic nuclei, SCN). The SCN in turn has a nerve connection with the pineal gland, which is responsible for the regulation of some hormones in our body (Fig. 2). So, there is a direct connection between light, bodily timing and hormones. Lighting has not only a visual effect but also a non-visual biological effect.

To understand the role of this third photoreceptor cell in our daily body cycle, we need to understand the connection of our body wake/sleep cycle with the light. The rotation of the earth about its own axis in exactly 24 hours results in a 24-hour rhythm of light and dark. This light-dark rhythm regulates quite a few bodily processes, for example, the sleep-wake rhythm, the rhythm in body temperature and heart rate, and the rhythm according to

which certain hormones are produced. These 24-hour rhythms are called circadian rhythms. This light-dark mechanism controls the hormones cortisol and melatonin over the course of the day and night. These hormones (cortisol: the “energy hormone”, and melatonin: the “sleep hormone”) play an important role in regulating our degree of alertness and sleep. Cortisol, amongst other things, increases blood sugar to give the body energy. Cortisol levels increase in the morning, then decrease gradually but remain at a sufficiently high level to give sufficient energy over the course of the day, falling finally to a

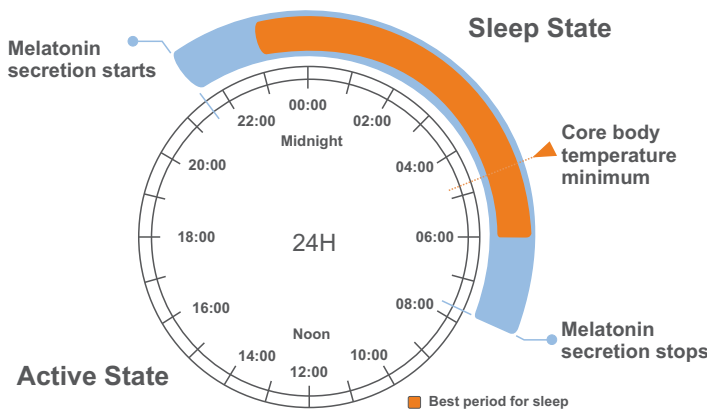


Figure 3: Schematic representation of our body clock cycle²

minimum at midnight. The level of melatonin, the sleep hormone, drops in the morning, reducing sleepiness.

ipRG cells are responsible for the synchronization of the pineal gland to the light-dark cycle. The pineal gland uses and sends information to regulate the production of these hormones as needed in the different stages of the day, modifying our physical and neurobehavioral capacities and the regulation of body temperature. It is also responsible for entraining our circadian system with the natural day-night cycle.

Let us see how different lights effect human body:

Normally, light comes in every day to adjust our melatonin secretion and so reset our sleep/wake clock. The circle of Figure 3 helps to show when to time our light exposure and what sort of light is best.

Morning light is very effective at resetting the body clock. It shifts the sleep period earlier (so rotating it anti-clockwise in Figure 3, by a maximum of about an hour a day.

What is morning light? It is any light that is received during the first hours after the minimum core body temperature. Morning light makes waking up easier so that we become more of a “morning person”. Light that is bright and strong in blue wavelengths is most effective for regulating our sleep/wake cycle. One study has shown that even short pulses of light can be very effective to reset our body clock. Many of us – and not just “evening people” – need to use alarm clocks to wake up in the morning and meet our daily responsibilities. As we wake up, our cortisol levels rise naturally. Cortisol helps us wake in the morning and get ready for action. Insufficient daytime light exposure can disrupt our sleep. Extra light during the daytime can raise nocturnal melatonin levels and enhance circadian

amplitude.

During the daytime, again especially in the morning, it is best to be outdoors for a time. Light enhances alertness at all times of the day and night. During daytime alertness is usually appreciated, but at night-time it may be less desirable. This applies especially to people who hardly go outside and depend on indoor environments for their light exposure: e.g. workers and school children who spend most of their day indoors, and the elderly who cannot go outside because of physical limitations.

Evening light, as long as it is dim and low in blue (short wavelength) content, can help us relax and prepare for sleep. Bright evening light, though, makes us stay up later and can delay sleep – again by up to around an hour a day. That makes it more difficult to get up early the next morning.

What is evening light? It is light that hits our retina in the hours just before the minimum core body temperature. The closer the light is to the moment we reach our minimum core body temperature, the stronger the shifting action on our body clock.

Avoiding bright and blue lights in the evening allows us to stay up enjoying activities without disrupting our circadian rhythm.

Light at night suppresses melatonin and makes it more difficult to get to sleep, and so harder to get up early next morning. It does this within minutes of our eyes receiving the light, and even a few minutes' light pulse can be enough to suppress melatonin. It is still best to use as little light as possible at night, though. At night, light disturbs our sleep patterns, and it is best not to disturb them too frequently. We have evolved to sleep at night and that's what we should do. Whether we go to bed early or late is less important than keeping regular times.

The message from nature is clear: a regular sleep/wake rhythm is best for our performance and health. But within this, our bodies have evolved a kind of steering wheel, constantly adjusting the sleep/wake cycle, driven by light and melatonin.

1. The science of lighting by Wout Van Bommel and Abdo Rouhana, Philips Lighting University
2. The effect of light on our sleep/wake cycle by Luc Schlangen, principal scientist at Philips

**AUTHOR : NUPUR JHA,
NATIONAL APPLICATION SPECIALIST,
SIGNIFY INNOVATIONS INDIA LTD
SAUMEN BHAUMIK,
HEAD OF SPECIFICATION SALES,
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R. Nandakishore
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Raju Bista
Treasurer (2015)
Vice President (2016-17)
President (2018-20)



Shyam Sujan
Secretary General, Elcoma
2004 - till date

We regret that since we do not have records prior to 2003, we are not able to cover all the office bearers since the inception of ELCOMA i.e. 1970 till 2002



HAVELLS

HAVELLS INDIA

QRG Towers havells india 2d, sector 126 expressway noida 201304

Tel: 0120-3331000, fax: 120-3332000

E-mail ID:Marketing@havells.com

COMPANY PROFILE:

Havells India Limited a leading Fast Moving Electrical Goods (FMEG) Company and a major power distribution equipment manufacturer with a strong global footprint. Havells enjoys enviable market dominance across a wide spectrum of products, including Industrial & Domestic Circuit Protection Devices, Cables & Wires, Motors, Fans, Modular Switches, Home Appliances, Electric Water Heaters, Power Capacitors, Luminaires for Domestic, Commercial and industrial Applications.

Havells owns some of the most prestigious global brands like Havells, Crabtree, Standard Promptec and Lloyd. Its global network constitutes of 6000 professionals across 40 branches. Its 13 state-of-the-art manufacturing plants in India located at Haridwar, Baddi, Sahibabad, Faridabad, Alwar and Neemrana.

A strong distribution network continuously strives to set new benchmarks in prompt delivery and service to customers – powering their smiles like none other electrical brand in the country. Further to this the company pioneered the concept of exclusive brand showroom in the electrical industry with 'Havells Galaxy'. Today 500 plus Havells Galaxies across the country are helping customers, both domestic and commercial, to choose from a wide variety of products for different applications. Havells became the first FMEG Company to offer door step service via its initiative 'Havells Connect'. Thanks to the quality of products and quicker service, it has minimum customer complaints and highest customer satisfaction.

Today, Havells alongwith its brands, have earned the distinction of being the preferred choice of electrical products for discerning individuals and industrial consumers both in India and abroad. Thus complying with stringent quality norms at even the most testing markets, worldwide. It is committed to keep powering the world with its state-of-the-art innovations and energy-efficient solutions. Currently 70% of its product offering is energy efficient.

Havells, over the years, has embarked on the journey of social change through inclusive growth dedicated to the cause of our future and future generations. Therefore our CSR efforts revolve around five strong pillars of health & nutrition, sanitation, education, environment and skill development. These pillars not only move hand-in-hand with the ones envisioned by the Government but are also part of United Nations Sustainable Development Goals.

A humble beginning that started with serving just 1500 children across 5 schools grew to serving over 60,000 students across 693 schools daily in Alwar district. Havells initiated a sanitation drive in 2014 in government schools of Alwar district wherein the company built over 4000 eco-friendly bio-toilets in 400 schools. These eco-friendly bio-toilets use special bacteria developed by DRDO (Defence Research & Development Organisation) to convert human waste into biogas and water. The water can be used for gardening, cleaning or ground water recharge.

The group company, QRG Healthcare runs two hospitals in Faridabad consisting of 140 beds and 400 beds.

ESTABLISHED:

1. Business Domain	Electrical Goods, Consumer Goods
2. Product Brand	Havells, Lloyd, Crabtree, REO, Standard
3. Manufacturing Facilities	13
4. Products Manufactured	Wires & Cables, Switches & Switchgears, Fans, Geysers, Lighting, Solar,
5. Details of Exports (Products/countries/value etc.)	Sales Presence in more than 40 countries
6. Directors and their contact details (phone, e-mail, location etc)	1. Mr Anil Rai Gupta CMD anilrai.gupta@havells.com 2. Mr Ameet Gupta – Whole time Director ameet.gupta@havells.com 3. Mr Surjit Kumar Gupta Non Executive, Non Independent
7. Contact Persons for a.Business Development b.Exports c.Production (With names, designation & Addresses)	Business Development - a. Mr. Subrata Sen - subrata.sen@havells.com b. Mr. Sobat Aswal - SOBAT.ASWAL@HAVELLS.COM Exports - Mr Vishal Sharma- vishal3.sharma@havells.com Production – Mr. Upendra Kumar Shukla UPENDRAKUMAR.SHUKLA@HAVELLS.COM
8. Regional Offices – Contact person / address	Ahmedabad, Amritsar, Bangalore, Bhopal, Bhubaneswar, Calicut, Chandigarh, Chennai, Cochin, Coimbatore, Dehradun, Delhi, Guwahati, Hyderabad, Indore, Jabalpur, Jaipur, Jammu, Jodhpur, Kanpur, Kolkata, Lucknow, Ludhiana, Madurai, Mumbai, Nagpur, Noida, Patna, Pune, Raipur, Rajkot, Ranchi, Siliguri, Srinagar, Surat, Trichy, Thiruvananthapuram, Udaipur, Vijayawada
9. E-mail	Marketing@havells.com



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COMPANY PROFILE:

COMPANY PROFILE : DIXON TECHNOLOGIES (INDIA) LIMITED HAS BEEN LEADING THE ELECTRONIC MANUFACTURING SERVICES (EMS) SPACE IN INDIA. A HOME GROWN MANUFACTURING COMPANY, DIXON TECHNOLOGIES PROVIDES DESIGN FOCUSED SOLUTIONS IN CONSUMER DURABLES, HOME APPLIANCES, LIGHTING, MOBILE PHONES ,MEDICAL ELECTRONICS AND SECURITY DEVICES TO CUSTOMERS ACROSS THE GLOBE, ALONG WITH REPAIRING AND REFURBISHMENT SERVICES OF A WIDE RANGE OF PRODUCTS INCLUDING SET TOP BOXES, MOBILE PHONES AND LED TV PANELS.

ESTABLISHED: 1993

1. Business Domain	Electronic Manufacturing Services (EMS)
2. Manufacturing Facilities	Noida (UP) Selaqui (Uttarakhand) Tirupati (Andhra Pradesh)
3. Products Manufactured	LED TV , Washing Machines, Mobile Phones, LED Lighting, Security Cameras, Medial Electronics & Set Top Boxes.
4. No. of employees	1185+
5. Directors and their contact details (phone, e-mail, location etc)	<ol style="list-style-type: none"> 1. Mr. Sunil Vachani 2. Mr. Atul B Lall 3. Mr. Manoj Maheswari 4. Ms.Poornima Shenoy 5. Dr.Manuji Zarabi 6. Mr.Keng Tsung Huo
6. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	<ol style="list-style-type: none"> a. Mr. Muneesh Dhawan V.P-Business Development b. Mr. Mahipal Singh Head Export c. Mr.Vineet Mishra- President COO- Lighting
7. Regional Offices – Contact person / address	Dixon Technologies India limited B-14/15 , Phase 2 Noida Mr. Muneesh Dhawan 09999033077
8. E-mail	info@dixoninfo.com

Dixon

TECHNOLOGIES UNLIMITED

...



Dixon Technologies (India) Limited is the largest home grown design-focused and solutions company engaged in Consumer Durables, Home Appliances, Lighting, Mobile Phones, Medical Electronics and Security Devices markets in India.

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B-14/15, Phase-II, Noida - 201 305 (U.P.), India

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WIPRO ENTERPRISES (P) LTD

C Block, CCLG Division, Doddakannelli, Sarjapur Road, Bangalore-560035,
Karnataka, India, Tel: 080-2844 0011, fax: 080-2844 0057
E-mail: sanjay.gupta5@wipro.com

COMPANY PROFILE:

Wipro Enterprises Private Limited comprises of two main business units namely Wipro Consumer Care and Lighting and Wipro Infrastructure Engineering. Wipro Consumer Care & Lighting is a leading player in Personal Care, Home Care, Lighting, Modular Switches and Office Furniture. Wipro Infrastructure Engineering is a diversified engineering business in the fields of Hydraulics, Aerospace, Water Treatment, Additive Manufacturing and Automation Solutions.

ESTABLISHED: 1945

1. Business Domain	Lighting, Switches, Office Furniture, Personal Care and Home Care
2. Product Brand	Wipro (Lighting), North West (Switches)
2. Manufacturing Facilities	Waluj (Maharashtra), Baddi (H.P), Haridwar (Uttaranchal)
3. Products Manufactured	Lighting, Furniture, Switches and Personal care
4. No. of employees	12000+
5. Directors and their contact details (phone, e-mail, location etc)	Mr. Vineet Agrawal CEO, Wipro Consumer Care & Lighting
6. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	Mr. Sanjay Gupta Sr Vice President, Wipro Enterprises (P) Ltd., C Block, Doddakannelli, Sarjapur Road, Bangalore - 560035
8. E-mail	sanjay.gupta5@wipro.com

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Wipro Lighting is proud of being one of the most trusted brands in lighting industry. We have continuously focused on embracing the latest & finest technology to deliver highly efficient products for different lighting application areas & have always believed in offering our customers the best in class, latest design, environment friendly lighting products & solutions. Wipro lighting has introduced IOT based smart connected home lighting solutions that are easy to use and can be controlled through mobile app & Voice control assistant. Wipro Lighting has won several prestigious awards for product design, innovation & quality excellence like the Red dot design awards, Frost & Sullivan award for LED lighting visionary innovation leadership and many more.



- Wide voltage range of 150-300 V
- Anti glare design with deep optics
- Driver with 2.5 kV surge protection
- Good color quality with Ra>80



COMPANY PROFILE:

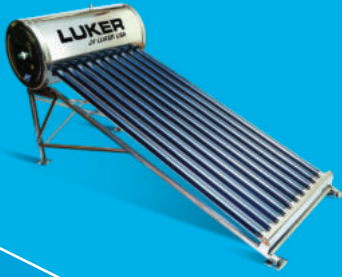
Luker Electric Technologies PVT Ltd is a joint venture with Luker USA that has made it gain popularity as the best lighting company in the world. The significant investment in developing new technologies has led the global lighting revolution with the likes of advanced fixtures and lighting solutions. Luker has developed and manufactured LED lights of the next-gen that meet local and international standards. It is undoubtedly the best lighting company integrating advanced thermal management, short circuit and open circuit protection including other innovative features. Added to this, the products undergo rigorous testing before it leaves the factories.

The history, experience, and approach to engineering and manufacturing of LEDs ensure that Luker is rated the best and the products stand out from the rest with high quality.

ESTABLISHED:

1. Business Domain	Manufacturing and trading of Electrical and Electronic products
2. Product Brand	Luker
3. Manufacturing Facilities	54, Krishnarayapuram Thotta Salai,, Old Cochin Bypass Road,, Chettipalayam, Coimbatore, Tamil Nadu, 641201
4. Products Manufactured	LED Luminaires
4. Other Products Traded	Fan, Water Heater, Air Coolers, Switch Gear
5. Details of Exports (Products/countries/value etc.)	LED Luminaires, UAE Rs. 1.33 Lacs`
6. Annual Lighting Turnover	Rs 164 Crores (LED Luminaires)
6. No. of employees	693 Employees
7. Directors and their contact details (phone, e-mail, location etc)	1. Jothish Kumar Vasudevan Nair, 9995655221, jk@lukerindia.com, Kerala 2. Antony VP, 9947264866, antonyvp2389@gmail.com, Kerala 3. E. Sivaramakrishnan, 9447140720, srk.e@lukerindia.com,Kerala 4. Aviral Jain, 9820339751, ajain@sigulerguff.com, Mumbai
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Jothish Kumar, CEO, Luker Electric Technologies Pvt Ltd - Cochin b. Steeve Irimpan, Senior Sales Manager, Luker Electric Technologies Pvt Ltd -Cochin c. Mohanan PM, 80752540314, Luker Electric Technologies Pvt Ltd - Coimbatore
9. Regional Offices – Contact person / address	Radhakrishnan K, 9633144133, Luker Electric Technologies Pvt Ltd - Cochin
10. E-mail	Srk.e@lukerindia.com

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WHY DOES INDUSTRIAL LED LIGHTING REQUIRE ROBUST COMPONENTS?

What to look for in the selection of a good driver

The heart is the primary organ that determines how well the rest of the human body functions. So, we pay a lot of attention to it and make sure we do what we can to keep it in top shape. We eat 'heart healthy' foods, keep up with exercise routines, reduce stress where we can etc.

It is a bit dramatic, but you would not be wrong to think of the LED driver as the 'heart' of an LED fixture. For all LED fixtures, you will always want a driver with the best specifications and quality level and you would obviously want it to last. Product managers want their drivers to operate at an optimum level for the life of the fixture and make the luminaire look great. They would never want the driver to poorly affect the LED fixture and how it operates on-a-daily basis. Many times we have seen that beautiful fixtures with sub-par drivers often do not meet their anticipated potential.

Many people don't realize the importance of the LED driver (power supply) selected and designed into the fixture. LED drivers significantly influence the performance, reliability and lifetime of a luminaire. Selection of a reliable LED driver is utmost important for better functioning of Luminaire fixture. This is even more important when the operating environment is challenging. Industrial environments from warehouses to manufacturing plants are more harsh than typical work environments such as commercial office spaces. Temperatures can be extremely cold or hot because of a lack of heating, ventilation and air conditioning, and equipment may be partially exposed to the elements. In addition, there may be heavy equipment and machinery that causes voltage spikes and vibration, or other environmental conditions such as humidity and dust that affect equipment performance and long-term reliability.

Luminaires for industrial settings need to be built to withstand these harsh conditions. They must be able to operate efficiently and support the safety and productivity of both the occupants and machinery in the facility. The quality and specifications of the LED driver installed in the luminaire is critical because it determines how well the luminaire will perform from an energy efficiency, light quality and reliability perspectives.

Energy efficiency

LED lighting operates at significantly lower power consumption levels as compared to fluorescent or high intensity discharge (HID) technologies. With advancements in lighting controls, LED luminaires can take advantage of wireless sensors and controls to further optimize a lighting system. Leveraging sensors, dimming strategies, and natural light can further reduce energy consumption while still maintaining optimal levels of light in the space.

High Quality of Light

Due to the high ceilings in industrial environments, luminaires must operate with a high light output to illuminate work areas brightly and evenly so that employees, as well as the machinery, can work safely and efficiently. Additionally, the quality of light, including flicker, dimming performance and DIM-to-OFF, can be critical in some environments such as food processing plants, hospitals, stadiums, schools and factories.

Many industrial facilities leverage scanning systems for real-time visibility of inventory. Where scanning systems are applied, the lighting must not only be bright, but its quality must also be high, so that these systems, most of which are very sensitive to ambient light, can work properly. Industrial LED drivers should ensure high quality of light with low output flicker and stroboscopic effects even at minimum dim levels.

Ripple current and light flickering (modulation)

Light modulation describes how much the instantaneous value of the luminous flux is varying. Human perception strongly depends on this frequency. In practice, many drivers naturally deliver a high content of 100-Hz modulation. The root cause for this is the 50-Hz mains supply, which results in 100 Hz after rectification.

Compared to traditional fluorescent light sources, LEDs instantaneously translate their operating current into light, without much smoothing effects. Minor imperfections of the driver can lead to a low quality of light. The LED driver should ensure that the 100-Hz light modulation is so small that it normally cannot be perceived by the human eye and is therefore not critical within a standard application.

Premium-quality LED drivers produce less than 5 % modulation and are therefore often called "flicker-free" or "zero ripple".

Reliable Light Output Across a Wide Temperature Range

Luminaires are usually installed at ceiling heights of 25 feet or higher in industrial spaces. Addressing any problems with lighting fixtures can require not only skilled personnel but often special equipment. This makes maintenance challenging and costly especially if machines or production lines must stop while the maintenance is done.

It is critical that luminaires in this environment are highly reliable and energy efficient. A high-quality luminaire requires a reliable LED driver which can operate in harsh environments consistently across a wide ambient temperature range (-20C to 60C) and support low touch maintenance programs.

AUTHOR: OSRAM LIGHTING PRIVATE LIMITED

NEED FOR SAFETY AND REGULATION FOR UV-C PRODUCTS

Mr Soumo Ghosal recommends steps needed to regulate UV products and protect consumers

It has been almost nine months now, that the world has been struggling to find a solution to destroy and contain the new coronavirus SARS-COV-2 which is responsible for COVID19 disease. A vaccine for same is yet to be developed but the lighting industry all over the globe is coming up with UV-C devices and sources in variant shapes and sizes. UV-C can inactivate malignant microorganisms and viruses safely by applying appropriate safety measures. In this context it should be noted that initial research results demonstrate that UV-C also effectively neutralizes SARS-CoV-2.

The UV Disinfection market is already an established one with quite a few specialized professional equipment manufacturers but the added interest of lighting manufacturers to come up with UVC Lamps and devices has added more fuel. Product manufacturing has increased since the outbreak of the COVID-19 pandemic. Various organizations are coming up with varied concepts and products for disinfecting high tech surfaces and areas with large flow of people like airports, hotels, shopping malls, offices, hospitals etc.

Ease of installation and low maintenance, supervision, and space requirements have also led to the growing demand for this

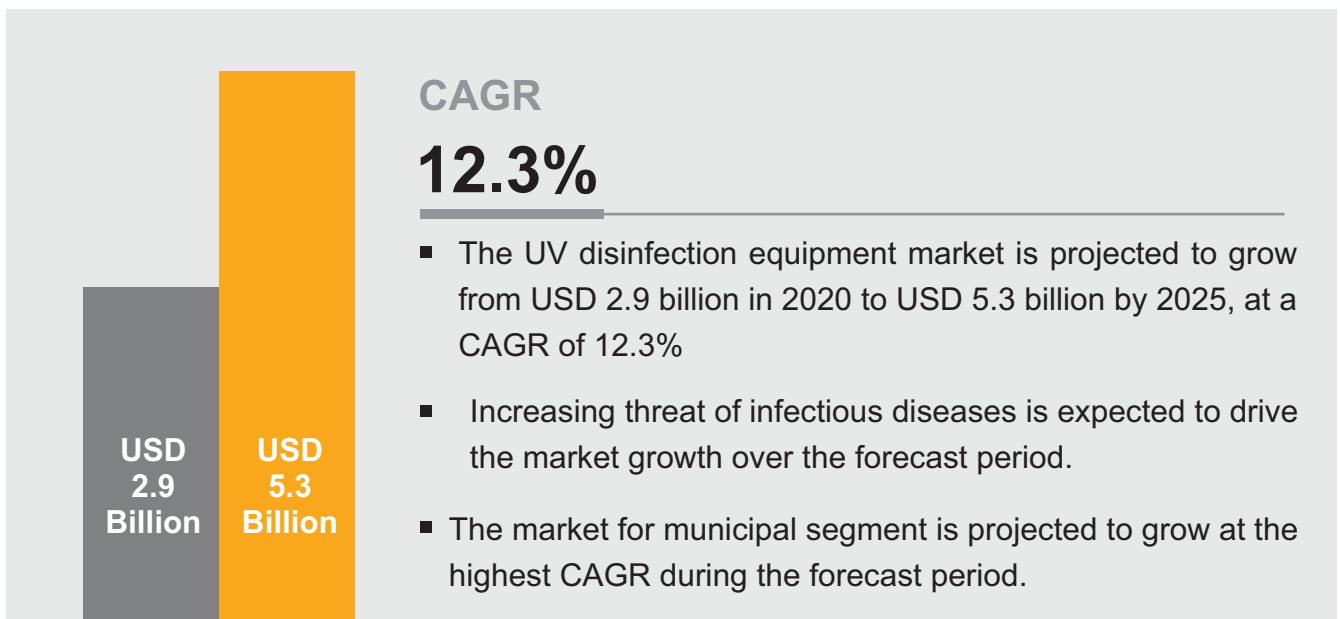
technology. In addition, the equipment also provides improved safety, minimum service time, and low sensitivity to pH and temperature variations compared to traditional disinfection technologies, such as chlorination. UV lamps led the market and accounted for 31.0% of the global revenue share in 2019 on account of the increasing demand in water and wastewater treatment plants.

Overview of the Market for the UV Disinfection System

The global UV disinfection equipment market size is projected to grow from USD 2.9 billion in 2020 to USD 5.3 billion by 2025 at a CAGR of 12.3% from 2020 to 2025. Key factors fueling the growth of this market include increasing demand for UV disinfection equipment due to threats of infectious diseases, and long life and lower power consumption of LED-based UV disinfection equipment.

UV disinfection equipment can employ single or multiple UV lamps depending on its function. The decreased operating cost of UV disinfection equipment due to the adoption of UV LED has fueled the growth of the market. The high reliability of UV disinfection equipment with UV lamps is expected to drive the

Attractive Opportunities in the UV disinfection equipment Market



market further.

UVC Performance

The performance of a UVC germicidal irradiance depends on the correct design calculations with proper derating and life estimations followed by thorough evaluation through testing and verification. The performance as per the claim of the manufacturer has to be maintained with sufficient reliability over the declared life class of the product. Any failure mode will expose the consumer to the risk of infection leading to potential health hazard. There exists no standardized testing mechanism for performance evaluation at present.

The effectiveness of UV-C radiation as a disinfectant is determined by:

- action spectrum of the microorganisms and/or viruses
- wavelength of the UV-C radiation (common unit: nm)
- UV-C dose, or fluence, (UV-C energy/unit area - J/m^2 or mJ/cm^2) which is the product of: UV-C irradiance (UV-C power/unit area - W/m^2 or $\mu W/cm^2$) and amount of time the microorganism or virus is exposed to the radiation (secs).
- application characteristics such as:
 - distance of UV-C source to the surface (in the case of surface-disinfection)
 - material surface characteristics (in the case of surface disinfection)
 - air-circulation (in the case of air-disinfection)
 - incident beam-angle of the UV-C source
 - ambient temperature and humidity
 - reflection of ceilings, wall, furniture, etc.

Keeping in mind the above features for effective disinfection of a given product, the performance testing requirements may be summarized as verification of below parameters:

- Peak Wavelength and FWHM (Full width at half maximum i.e. the wavelength bandwidth)
- Study of the entire UV Spectrum (Please note that 265nm has the maximum germicidal efficiency)
- The overall radiant flux and efficiency of the source at product level

- Estimation of switching cycle performance.
- Estimation on maintained lumen after a defined period of time (typically can be tested for 25% of declared life or 3000 hrs whichever is lower)
- Proof of the Log Reduction Value (LRV) through either actual photobiological testing or through documented measurement of irradiance values at the application area.
- In case of system design for a 3D space, a typical measurement of the UVC source distribution will help in ray tracing and arriving at uniform irradiance.
- At actual dosage measurement at application area.
- Evaluation of material degradation under the effect of long-term UV exposure.

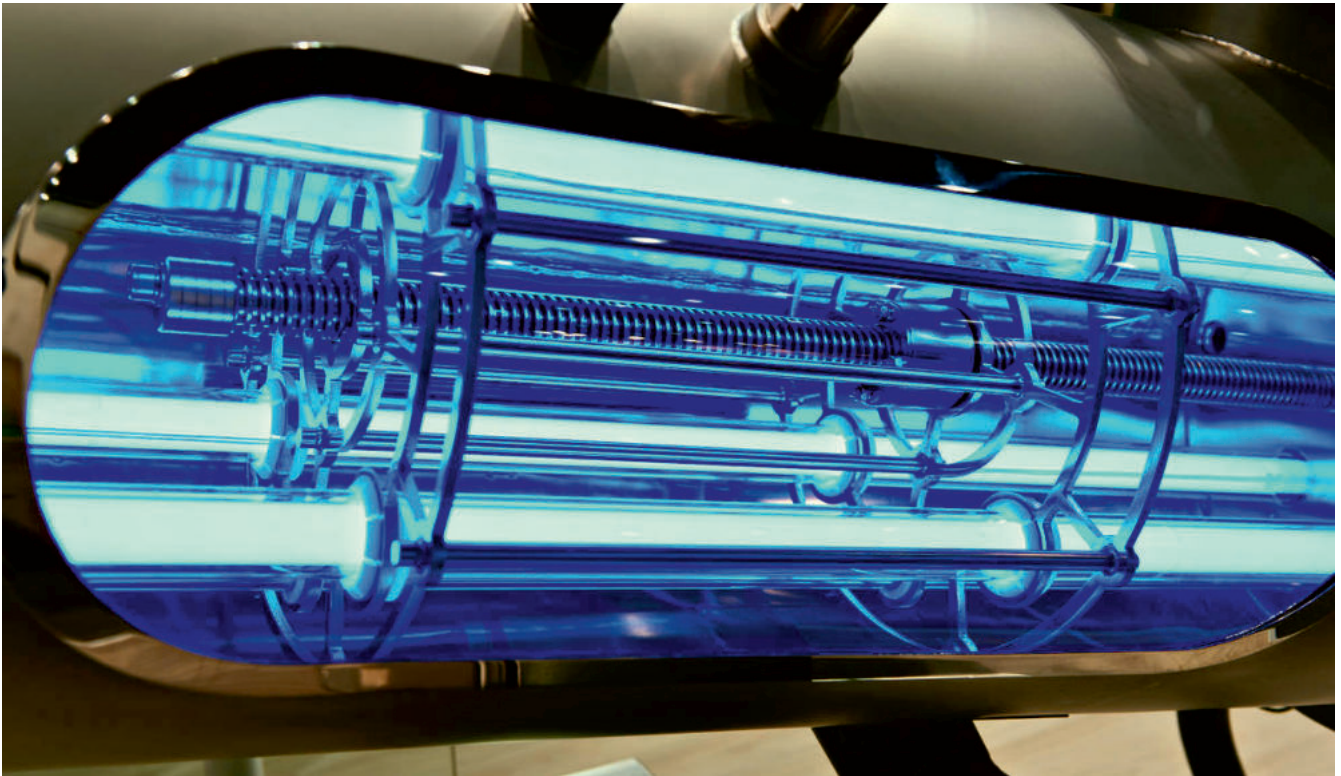
Safety Requirements

UV-C devices produce a monochromatic or broadband UV-C irradiance in the 100 nm to 280 nm wavelength range. For effective disinfection purposes, the UV-C irradiance energy of these UV-C devices is much higher than normal sunlight. These high UV-C irradiance energies can present hazards to exposed humans, animals and materials. However proper safety measures can mitigate such effects.

The hazards are twofold - irradiance and ozone (O₃). The irradiance hazard can damage the human eye and cause a severe sunburn-like reaction to the human skin. The irradiance hazard can also damage materials. The ozone (O₃) hazard occurs at wavelengths below 240 nm and can cause a toxic reaction in the human body.

Suitable safety measures vary depending on the UV-C source and application. They may include (a) shielding to prevent direct exposure to people, pets and delicate materials; (b) fully containing the source in a chamber or enclosure; (c) access control or presence sensing to prevent operation of the source when a space is occupied; (d) interlock to prevent operation of the source when its enclosure is opened' (e) timer or other control to limit operating time per 8-hour period corresponding to maximum irradiance guidelines; (f) personal protective equipment such as goggles, gloves, mask, shield or dosimeter; (g) warning labels, installation instructions, operating manual and training.

As with any human-machine interaction, UV-C disinfection



sources and products and their application environments must be used correctly to be safe. The Global Lighting Association has issued its Position Statement on Germicidal UV-C Irradiation: UV-C Safety Guidelines which addresses this issue in detail.

Regulatory Requirement

Though UVC Germicidal Applications have been in existence for more than ninety years now, the regulatory requirements and the standard methods for measurement and reporting of data is not present in a structured format.

There are varied issues of market being flooded with unsafe products. Some UVA LED products are being sold as germicidal, some UVC products are being sold in consumer spaces without proper safeguards or warnings. Better understanding of the human hazard, building material degradation, abnormality in plant growth, hazard to pets etc. caused due to long term exposure to UVC is needed. Hence it is strongly recommended to put the UVC products under regulation.

Unfortunately, the online retail market is growing rapidly with handheld and portable consumer oriented UVC germicidal devices, many of which do not employ proper containment or other equivalent means of protection. Instead, these tend to rely solely on markings or integral timers, unreliable sensors, or

remote controllers, which still leave room for scenarios where humans or animals can be over-exposed to the UVC light. Without better safeguards and without consumers being more fully aware of risks and trained in proper operation, this would place an unrealistic responsibility on the user and, consequently, such products at present cannot be certified.


For all UVC consumer products sold, certification is essential. And warning labels are not enough as children or pets cannot be expected to follow written warnings, and home environments pose innumerable situations that could result in misuse and potential harm when the technical safeguards are inadequate. Some of the cheap unreliable products which have flooded the online market should be assessed and strongly covered under a regulatory framework so that the consumer safety is ensured.

The UVC task force setup by ELCOMA is also working in close cooperation with the Bureau of Indian Standards to release an Indian standard for the safety of UVC Sources and devices and advocating strongly for the requirement of a regulation for such products.

**AUTHOR: SOUMO GHOSAL,
SENIOR MANAGER- PRODUCT VALIDATION
CENTRE FOR RESEARCH & INNOVATION,
HAVELLS INDIA LIMITED**

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

COMPANY PROFILE:
ESTABLISHED: 2006

1. Business Domain	Electrical Lighting Products
2. Product Brand	
3. Manufacturing Facilities	2 Manufacturing facility in Noida
4. Products Manufactured	LED Lamps, Panels, Battens, Downlighters, LED Street Lights, LED Flood Lights, LED Well Glass & Industrial Luminaires
5. Other Products Traded	LED Strip light, COB Spot Light
6. Details of Exports (Products/countries/value etc.)	LED Lamps, Battens Street light(UAE, Nepal & Singapore)
7. No. of employees	Approx. 250
8. Directors and their contact details (phone, e-mail, location etc)	Mr. Rakesh Khanna (rakesh.khanna@orientelectric.com Delhi)
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mr. Puneet Dhawan (Ex. VP) b. Mr. Santosh Upadhyay (AGM) c. Mr. Ashwani Sharma (GM)
10. Regional Offices – Contact person / address	As mentioned above
11. E-mail	Puneet.dhawan@orientelectric.com

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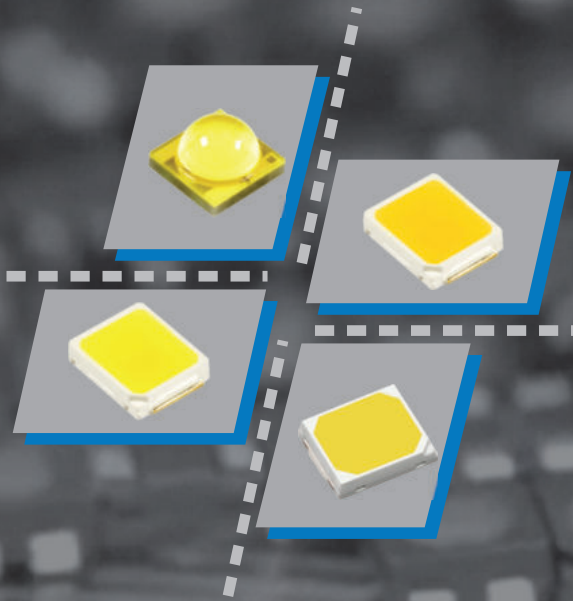
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*Applicable for India Only.

**COMPANY PROFILE:****ESTABLISHED: 2015 (INDIA OFFICE) 1997 (CHINA OFFICE)**

1. Business Domain	Led components
2. Product Brand	MLS
3. Manufacturing Facilities	China (5 factories)
4. Products Manufactured	Led Components , Tubes, Bulbs
5. Other Products Traded	NA
6. Details of Exports (Products/countries/value etc.)	India , Europe , USA
7. No. of employees	4
8. Directors and their contact details (phone, e-mail, location etc)	Krishan Sujan - 9871675599
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	Shobhit Bhasin - 8800314447
10. E-mail	Shobhit.bhasin@mlsindia.net



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.

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NO. 1

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TOP 3
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Group Revenue

3,000,000,000
3 Billion LED packages per day

MLS INDIA PRIVATE LIMITED

COMPANY PROFILE:

Halonix is amongst India's fastest growing electrical company that caters to both retail and institutional buyers with its innovative and smart-tech offerings across Lighting, Fans, Smart IOT products and products focusing on Safety & Security. Spearheading the technological revolution, the company has been at the forefront of introducing energy-efficient lighting solutions. Today, Halonix is one of the top 5 lighting brands in the lighting industry. Committed to the credo of Make in India & Made for India, Halonix's success lies in its understanding of the harsh Indian climatic conditions and power quality and its unparalleled ability to design, develop and manufacture products accordingly. Halonix Technologies is one of the few companies in India, which has a fully accredited NABL self-certified laboratory and state-of-the-art R&D laboratory within the manufacturing plant that allows its dedicated R&D and design teams to push the envelope and develop cutting-edge products tailor-made for Indian consumers. Halonix has also established in the Fans category with the launch of innovative products by combining innovation and user-centric design to create greater value for its customers in this category too. Halonix Shield is Halonix's latest foray to provide innovative, value-for-money solutions to meet safety, security and hygiene needs of fellow Indians. As part of this endeavour, Halonix Shield is at the forefront of bringing novel, state-of-the-art, indigenously manufactured UVC sanitisation products and solutions for residential as well as institutional use.

ESTABLISHED:

1. Business Domain	Lighting, Fans and Smart IOT Products
2. Product Brand	Halonix
3. Manufacturing Facilities	Halonix Technologies Pvt. Ltd. Plot No.5, Sector 12, IIE SIDCUL, Haridwar, Uttarakhand - 249403
4. Products Manufactured	LED Lamps, LED Luminaires, HID, Halogen, Fans, Smart IOT Products, UV Products (Halonix Shield)
6. No. of Employees	930
7. Directors and their contact details (phone, e-mail, location etc)	Mr. Rakesh Zutshi B-31, Phase II, Noida Tel: 0120-4756100, Email: rakesh.zutshi@halonix.co.in
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mr. Sameer Jindal VP – Institutional Sales, Tel: 9999159666, Email: sameer.jindal@halonix.co.in b. Mr. Kalyan Mojumder VP – Retail Sales, Tel: 9953100607, Email: kalyan.mojumder@halonix.co.in c. Mr. Prabhakant Shukla VP – Production, Tel: 9997297111, Email: prabhakant.shukla@halonix.co.in
9. Regional Offices – Contact person / address	Mumbai: Halonix Technologies Pvt. Ltd. B403 – 404, Kemp Plaza, Above Bank of Baroda, Near Mindspace, Off Link Road, Malad – West, Mumbai – 400064, Tel: +91 -022 – 42646362 Bangalore: Halonix Technologies Pvt. Ltd. No.6 "Legacy " 1st Floor, Convent Road, Richmond Town Bengaluru – 560025, Tel: + 91 – 080 - 41125296 Kolkata: Halonix Technologies Pvt. Ltd. 67B Ballygunge Circular Road, Ballygunge Park Tower, 9th Floor, Kolkata – 700019, Tel: +91 – 033 – 40081849
10. E-mail	customer@halonix.co.in

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Toll Free No.: 1800-103-6564 | E-mail: customercare@halonix.co.in | Website: www.halonix.co.in

COMPANY PROFILE:

ESTABLISHED: 1996

1. Business Domain	Manufacturing & Trading
2. Product Brand	Tridonic
3. Manufacturing Facilities	Shahapur, Thane District
4. Products Manufactured	Ballast
6. No. of employees	36
7. Directors and their contact details (phone, e-mail, location etc)	1. Bhavin Soonderji bhavin@tridonic.co.in 2. Jyotsna Soonderji
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Nilakshi Kadam Sales & Business Development 9321766055 b. Rakshit Rathi Sales & Business Development 9311466055
9. Regional Offices – Contact person / address	Head Office, Mumbai, 022 22025528
10. E-mail	bhavin@tridonic.co.in

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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 . Since 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.

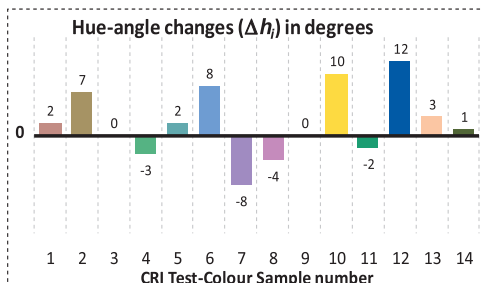
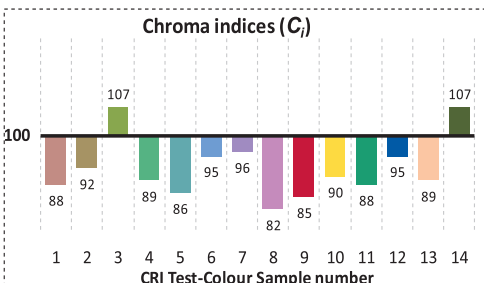
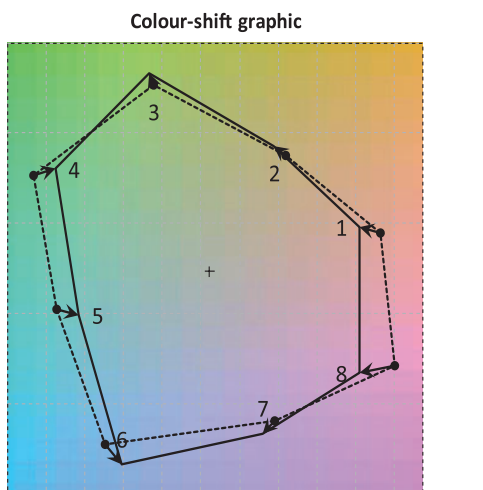
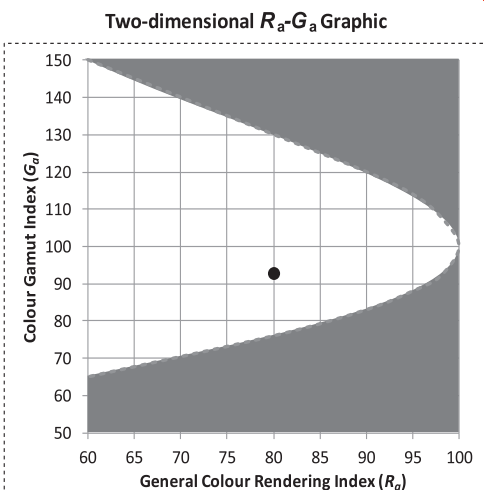
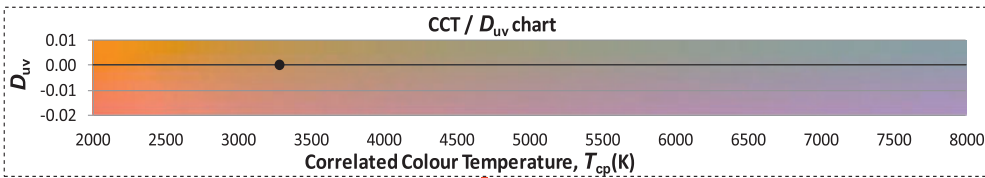
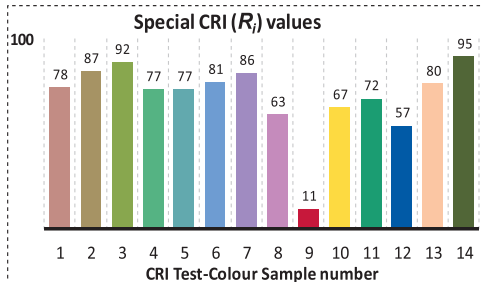
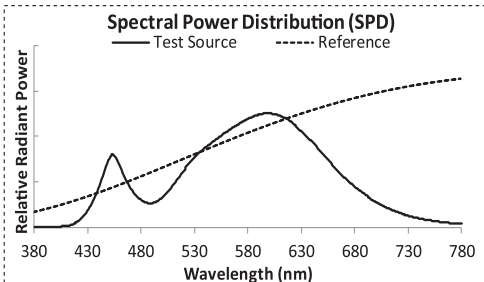
CIE is the globally recognized organization for characterizing light and lighting and for publishing international reports and standards in this field. The recently published document CIE 224 includes a new colour rendering index (R_f), which is based on IES TM-30-15, but the CIE recommends this new 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.

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



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 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.



50 YEARS OF ELCOMA IN INDIA

VARIOUS ACTIVITIES BY ELCOMA



Conferences

Conferences on New Technology and product inviting all stake holders from Government, Architectures, PWD, CPWD, Designers, manufacturers etc.



Exhibitions

Exhibitions - Light India bi-annually inviting B2B from India and abroad. Besides Regional exhibitions are held on regular basis.

Workshops

Workshops are organized for standards, Government polices etc.



Technical Training

Knowledge sharing training programs are held for Front-end and Back-end staff on product knowledge, installation, maintenance and monitoring

Safety and Security

Conduct Training program on safety and security



Magazine

Publishes Magazine IllumiNation quarterly

Directory

Bi-Annual Directory giving Member's profiles and contact details.



White Paper on LED General Lighting and Blue light

International Illumination Society (ISA)
China Solid State Lighting Research Institute (CSLI)
China Illumination Society (CIS)

July 2015



Position Statement on Germicidal UV-C Irradiation

UV-C SAFETY GUIDELINES

May 2020

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India's street lights form a crucial component of the nation's investment on lighting and road safety. Launched in 2015, EESL's Street Light National Programme (SNLP) has been instrumental in replacing over 1.08 crore LED street lights across India, leading to energy saving of 7.28 billion kWh per year with avoided peak demand of 1.213 MW and estimated GHG emission reduction of 5 million tCO₂ per year

Energy Efficiency Services Limited

Reports

Reports on specific technology in support with global organizations

Members participate in Lighting up Monuments and other places of interest.



Bogibeel Bridge by Bajaj Electricals



Qutub Minar by Signify



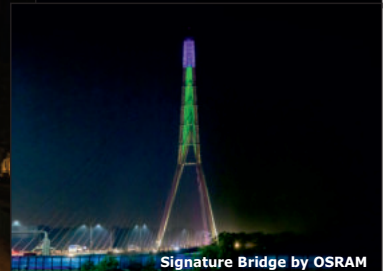
Golden Temple by Osram



Leh Palace by Surya Roshni



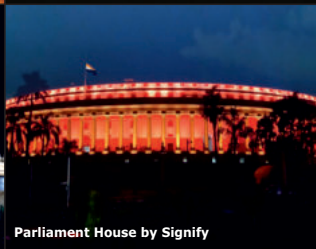
Rashtrapati Bhavan by Signify



Signature Bridge by OSRAM



Pupukhta Sahib by Jaquar Lighting

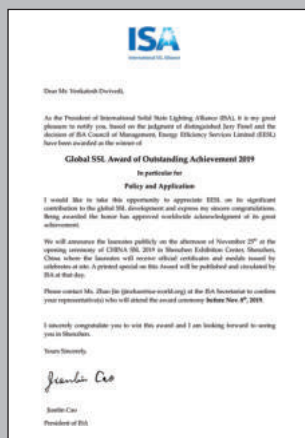


Parliament House by Signify

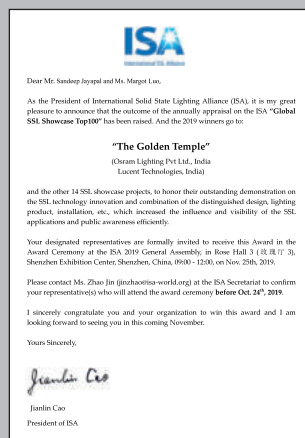


Majesty of old fort by Havells

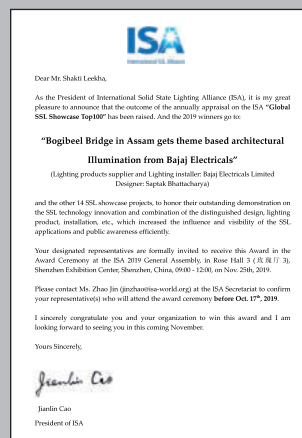
Members are recognized due awarded by International Organization for best Lighting projects



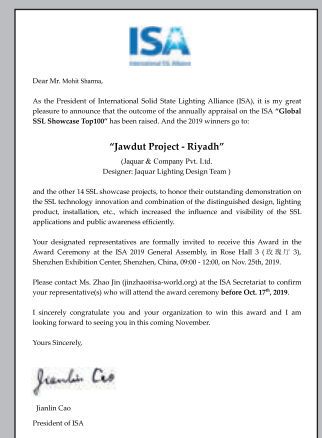
Energy Efficiency Services Limited



Osram Lighting Power Limited



Bajaj Electricals



Jaquar & Company Privaye Limited

Creating Standards for Indian Conditions

ELCOMA participates in product standards development in support with BIS and BEE



Government Support

ELCOMA continues to foster best relationship with various Government Departments

International Relationships

ELCOMA has built good relationships with international organizations

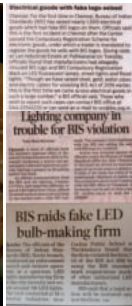
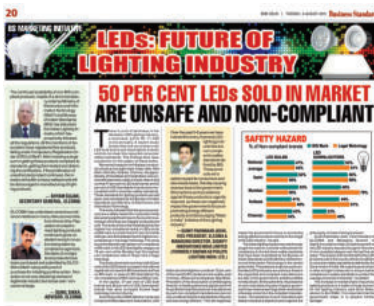


Invites Delegates to Visit India

Invites Delegates from abroad to visit India on several occasions

Environment Friendly

ELCOMA plays very important role in Safe Disposal and creates Environment Friendly atmosphere



Awareness Programs

ELCOMA brings Awareness on Product Quality

ELCOMA promotes New Technology



Defines future of Lighting by preparing Vision plans.



COMPANY PROFILE:

ESTABLISHED:

1. Business Domain	Complete lighting solutions
2. Product Brand	Jaquar Lighting
3. Manufacturing Facilities	Manesar
4. Products Manufactured	Complete lighting products
6. Details of Exports (Products/countries/value etc.)	Complete LED lighting products / Africa, Middle East, Asia Pacific / 5 crore
7. No. of employees	597 (Lighting Division)
8. Directors and their contact details (phone, e-mail, location etc)	Mr. Ranbir Mehra – Director Jaquar lighting Email: ranbir.mehra@jaquar.com
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	Mr. Mohit Sharma Business Head- Jaquar lighting M: 9810716904 Email: mohit.sharma@jaquar.com
10. Regional Offices – Contact person / address	Manesar – Mr. Mohit Sharma
11. E-mail	mohit.sharma@jaquar.com



DEVTECH M2M LIMITED
 GAT NO.645, ABOVE BHARAT PETROL PUMP, OPP. KESHNAND PHATA,
 WAGHOLI, PUNE 412207, TEL: 02030516199
 E-mail: info@devtechm2m.com/parikshit@devtechm2m.com

COMPANY PROFILE:

ESTABLISHED:

1. Business Domain	DOMESTIC
2. Product Brand	Devtechm2m
3. Products Manufactured	LED, SPD, CCMS, Timer
4. Directors and their contact details (phone, e-mail, location etc)	1. Mrs. Renu Anjanikar Mobile - E-mail - Renu@devtechm2m.com Location - Pune
5. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mr. Yogesh Deshpande (AGM) Wagholi b. Rajkumar Taware (DGM) Wagholi
6. Regional Offices – Contact person / address	Mr. Yogesh Deshpande Mob - 7507301177 Add - Wagholi
7. E-mail	info@devtechm2m.com/parikshit@devtechm2m.com



LITEX ELECTRICALS PVT. LTD.
 W 134 S Block Midc Bhosari Pune 411026 Maharashtra India
 Tel: +91 20 66301073
 E-mail: sales@liteselectricals.com

COMPANY PROFILE:

ESTABLISHED:

1. Business Domain	Halogen Lamps for Entertainment, Infrared Heating and Laser Pumping Lamps
2. Product Brand	Cinolite, RadiHeat
3. Manufacturing Facilities	7,200 sq. ft facility
4. Products Manufactured	Halogen Lamps for Entertainment, Infrared Heating and Laser Pumping Lamps
5. Details of Exports (Products/countries/value etc.)	Infrared Lamps / Laser Pumping Lamps – US/UK/Europe/Egypt/Israel
6. No. of employees	40
7. Directors and their contact details (phone, e-mail, location etc)	Dr Avinash D Kulkarni, (dradk@hotmail.com) Shirish V Karkarey, (svk@liteselectricals.com) Dr Sharashchandra V Rajarshi, (svr@liteselectricals.com)
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	Dr Avinash D Kulkarni , (dradk@hotmail.com) Shirish V Karkarey, (svk@liteselectricals.com) Dr Sharashchandra V Rajarshi, (svr@liteselectricals.com)
9. E-mail	sales@liteselectricals.com



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 AN ISO 9001:2015 CERTIFIED COMPANY

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For any inquiries or any other information please contact us at:

M/s. Arklite Speciality Lamps Pvt. Ltd.
 Gat No. 2794, Chakan Talegaon Road, Kharabwadi,
 Pune - 410 501 Tel. No.: 09881742351 / 09881249353
 Email: sales@arklite.co.in Web: arklite.co.in

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Bringing performance to light

Quartz Infrared Halogen Lamps

(Near infrared, short wave, fast response medium wave, medium wave)
 for PET Bottle manufacturing, Paint Curing, Printing, Paperboard Manufacturing and a host of applications.
 Custom designed lamps to your needs

Halogen Lamps for Entertainment

A range of the most popular 1000 Watt and 2000 Watt lamps in different configurations used by the film, stage and studio industry

And, a range of Xenon & Krypton filled Laser Pumping Lamps for a variety of applications.



Litex Electricals Pvt. Ltd.

W 134 S Block MIDC Bhosari PUNE 411026

Website : www.litexelectricals.com Email : sales@litexelectricals.com



CEMA ELECTRIC LIGHTING PRODUCTS INDIA PRIVATE LIMITED

34/389c, Mullassery, Padivattom , Edappally, Cochin 682024

Tel: 04848 2809341/42/9895759269

E-mail: Nandakumar@cemalighting.com, Webside : www.cemalighting.com

COMPANY PROFILE:

ESTABLISHED:

1. Business Domain	Lighting
2. Product Brand	CEMA
3. Manufacturing Facilities	Factory at Limbasi, Gujrat
4. Other Products Traded	LED Lamps, LED Luminaries
5. Details of Exports (Products/countries/value etc.)	NIL
6. Directors and their contact details (phone, e-mail, location etc)	<ol style="list-style-type: none"> 1. Mr. Nandakumar C, 9895759269 nandakumar@cemalighting.com Cochin 2. Mr. K N Devdas, 9825600659 kn.devdas@cemalighting.com Nadiad, Gujarat 3. Mr. K N Jagadish, 9895759268 Jagadish@cemalighting.com Cochin
7. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	<ol style="list-style-type: none"> a. Mr. Nandakumar C, Mob: +91 9895759269 nandakumar@cemalighting.com b. Mr. Ramesh N Chandra, Mob: +91 9845019153 ramesh@cemalighting.com c. Mr. K N Devdas, Mob: +91 9825600659 kn.devdas@cemalighting.com
8. E-mail	nandakumar@cemalighting.com



FULHAM (INDIA) PVT. LTD.

SURVEY NO. 26/3, VILLAGE NARHE, TALUKA - HAVELI,
DIST PUNE - 411041, TEL: +91 20 24690703/04

E-mail: sratti@fulham.com

COMPANY PROFILE:

Fulham is a leading global provider of intelligent, sustainable commercial lighting components and electronics for use in indoor, outdoor, signage, horticulture, UV, Emergency, and other applications. Fulham sells its lighting solutions worldwide through original equipment manufacturers (OEMs) and electrical equipment distribution channels. Headquartered in Hawthorne, California, the company has sales and/or manufacturing facilities in North America, Europe, India and Asia.

ESTABLISHED: 2011

1. Business Domain	Manufacturing
2. Product Brand	Fulham
3. Manufacturing Facilities	Pune
4. Products Manufactured	Led Drivers, Led Modules, Emergency Lighting systems, Controls and UV lighting Solutions
6. Details of Exports (Products/countries/value etc.)	Led drivers, Led modules to USA, Middle East, China & Europe
7. No. of employees	300
8. Directors and their contact details (phone, e-mail, location etc)	<ol style="list-style-type: none"> 1. Mr. Gautam Malkani Email: gmalkani@fulham.com 2. Mr. Subrata Ghose Email: sghose@fulham.com 3. Mr. Moti Malkani Email: motibm@multilighting.in 4. Antony Corrie Email: acorrie@fulham.com 5. Brian Wald Email: bhwald@hotmail.com
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	<ol style="list-style-type: none"> a. Mr. Upender Singh b. Mr. Gautam Malkani c. Mr. Subrata Ghose
9. Regional Offices – Contact person / address	<p>Pune Mr. Shekar Kapadne Cell No.: +91 9168626413</p> <p>Gujarat Mr. Pranav Joshi Cell No.: + 91 9904550233</p> <p>New Delhi Mr. Rakesh Kumar Cell No.: + 91 9999557024</p> <p>Bangalore Mr. Dinesh Kumar Cell No.: + 91 9600175391</p> <p>Mumbai Mr. R. Vignesh Kumar Cell No.: + 91 9513333196</p>
10. E-mail	sratti@fulham.com

COMPANY PROFILE:

Alien energy is into manufacturing of LED Lights & Roof Top Solar Power Plant. The Director Mr. Akash Jain has been Awarded by association of Energy engineers (AEE U.S.A) the best Energy Engineer in Asia for the year 2019-2020. Alien Energy provides LED Lights to corporats at Zero CAPEX at zero investment through ESCO route on shared saving modules.

ESTABLISHED:

1. Business Domain	LED Lighting & Solar Product
2. Product Brand	alienenergy™
3. Manufacturing Facilities	A 16/6, Om Sai Complex, Site IV, Industrial Area, Sahibabad Ghaziabad (UP)- 201010 Contact: 7840047512
4. Products Manufactured	All types of LED Light & Solar Product
5. Other Products Traded	Electronics Controls / Energy Savings Devices
6. Details of Exports (Products/countries/value etc.)	Srilanka, Africa, Bangladesh, Nepal, Turkey
7. No. of employees	150
8. Directors and their contact details (phone, e-mail, location etc)	1. Akash Jain, (akashjain@alienenergy.in), Contact: 9810160265 2. Monika Jain, (monikazain28@gmail.com)
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Anjani Kumar, (anjani@alienenergy.in) b. Dinesh Sharma, (dinesh@alienenergy.in) c. Santoshi Rawat, (info@alienenergy.in)
10. Regional Offices – Contact person / address	Akash Jain , Mob: 9810160265 North: 91, Kiran Vihar, Karkardooma, Delhi-110092 Jay Parekh , Mob: 9820282142 West: 102, 1st Floor, Solitaire Heights CHS Ltd., Goregaon, Mumbai - 400 104
11. E-mail	akashjain@alienenergy.in, info@alienenergy.in, enquiry@alienenergy.in

RK LIGHTING PVT. LTD

 223, adhyaru industrial estate, sunmil compound, lower parel, mumbai-400013
 TEL: 022-67124462/63, E-mail: rklights@gmail.com

COMPANY PROFILE:
ESTABLISHED:

1. Business Domain	RLUX
2. Product Brand	N/A
3. Manufacturing Facilities	DAMAN (U&T)
4. Products Manufactured	LED LUMINAIRES, LED COMPONENTS
5. No. of employees	300-450
8. Directors and their contact details (phone, e-mail, location etc)	MR. AMIT SURESHKUMAR KHANDELWAL (DIRECTOR), Mob: 9820191147 Email: rklights@gmail.com,
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	As above
10. Regional Offices–Contact person / address	As above
5. No. of employees	rklights@gmail.com

COMPANY PROFILE:

One of the largest Lamp Cap & Stamping Parts manufacturing in Asia-Pacific. Expertise in a wide range of Lamp Caps. First Lamp Cap Company accredited with ISO-9002 in 1997 & ISO-9001-2015 & ISO-14001-2015. First producer of FTL Crimping Pins in India. The Leading manufacturer of LED Mechanical Parts in India.

ESTABLISHED:

1. Business Domain	ARVIND PRESS CAPS LTD.
2. Product Brand	NIL
3. Manufacturing Facilities	BHIWADI, RAJASTHAN
4. Products Manufactured	ELECTRIC LAMP CAPS, LED COMPONENTS I.E. HOUSING, DIFFUSER, PLATE ETC.
5. Other Products Traded	NIL
6. Details of Exports (Products/countries/value etc.)	CHINA, IRAN, THAILAND, BANGLADESH ETC.
7. No. of employees	400 Nos.
8. Directors and their contact details (phone, e-mail, location etc)	1. Sh. Arvind Kumar Newar 2. Sh. Manish Kumar Newar 3. Sh. Vineet Bagaria 4. Sh. Giriraj Maheswari 5. Sh. Ajay Mathur E-mail: apclexp@rediffmail.com
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Sh. Ajay Mathur Chief Executive Officer b. Shaleen Kaushila Business Head
10. Regional Offices – Contact person / address	Sh. Ajay Mathur - Chief Executive Officer Arvind Press Caps Ltd. E-337, 346, RIICO Indl. Area, Bhiwadi - 301019, Alwar, Rajasthan, India.
11. E-mail	apclexp@rediffmail.com

COMPANY PROFILE:
ESTABLISHED:

1. Business Domain	Electronic Ballast & LED Light fixtures manufacturing
2. Product Brand	OEM & self-product brand is BISTEC & CENZER
3. Manufacturing Facilities	Mapusa, Goa
4. Products Manufactured	Slim panels, Surface panels, Recess COB spots, Track spot, Linear Profile, Smart LED Products, Industrial Products.
5. No. of employees	70
6. Directors and their contact details (phone, e-mail, location etc)	Mayur Jain (Proprietor) Mob - 9004617663 E-mail - mayurcenzer@yahoo.com Goa / Mumbai
7. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mayur Jain
8. Regional Offices – Contact person / address	#54, Mapusa Indl. estate, Mapusa Bardez, Goa
9. E-mail	mayurcenzer@yahoo.com



BAG ELECTRONICS (I) PRIVATE LIMITED

survey no. 19, Yewlewadi Kondhwa Road Pune 411048 Maharashtra India

Tel: 9595000200

E-mail: mdindia@bagelectronics.in

COMPANY PROFILE: BAG electronics (I) Private Limited

ESTABLISHED:

1. Business Domain	Electronics, Manufacturing, Trading
2. Product Brand	BAGIndia; Conneclight
3. Manufacturing Location	Pune
4. Products Manufactured	LED Drivers, LED Module, Light Management Systems UV-KIT UV Ballast
5. Products Traded	Luminaries, Sensors Lighting Software, Light Engine's
6. Country for Export	Sri-lanka, Pakistan, Germany, Dubai, Bangladesh, Turkey, Italy, Spain
7. No. of employees	150
8. Director Details	Mr. BS Praveen, MD & CEO b.praveen@bagelectronics.in 9595000200
9. Contact Person Business Development	Manoj Joshi m.joshi@bagelectronics.in
10. Contact Person Exports	Vitthal Hargude v.hargude@bagelectronics.in
11. Contact Person Manufacturing	Rahul Jagtap r.jagtap@bagelectronics.in
12. Head office Address	survey no. 19, Yewlewadi Kondhwa Road Pune 411048 Maharashtra India
13. E-mail	9595000200, mdindia@bagelectronics.in



CENTURY LED LIMITED

SRIJAN INDUSTRIAL LOGISTIC PARK, BLOCK-A, 1ST FLOOR, NH-6, BOMBAYROAD
ANKURHATI, DOMJUR, HOWRAH, PIN-711302, WEST BENGAL, INDIA,
TEL: 1800 345 1345, E-mail: customercare@magiklight.com

COMPANY PROFILE:

CENTURY LED LIMITED IS ONE OF THE VERY FEW COMPANIES TO ENTER THE LIGHTING SECTOR WITH ITS OWN STATE OF ART MANUFACTURING UNIT.

IT HAS ALWAYS STRIVED TO UNDERSTAND THE NEED OF THE CUSTOMERS AND OFFER SOLUTION THAT ARE BEST IN CLASS AND CONSUMER FRIENDLY.

ESTABLISHED:

1. Business Domain	LED LIGHTING
2. Product Brand	MAGIK
3. Manufacturing Facilities	<p>Century led limited having its own state-of-art manufacturing unit at Howrah, is one of the top manufacturing companies in West Bengal. It is a 60,000 Sq Ft fully owned manufacturing unit and 20,000 Sq Ft warehouse leased facility. Key Highlights of the manufacturing facility.</p> <ul style="list-style-type: none"> • NABL Certified testing facility • Strong In-House R&D, design, testing, manufacturing and delivery units. • A capacity of over 20 lacs units per month • Over 100 tests at components, Process and finish goods level. • Quality commitment and ethical value.
4. Products Manufactured	<p>Century LED Limited provides a complete LED Luminaire range combining quality and aesthetics. We do provide solution for both outdoor as well as indoor lights. Key Products mentioned below:</p> <ul style="list-style-type: none"> • LED Lamps • LED Battens • LED Panels & Downlights • COB Downlights, Spotlights, Track Lights & Zoom Lights • LED Floodlights • LED Streetlights • LED Bollards & Post Tops • LED Strip Lights
5. Other Products Traded	Only around 10% of our existing products are Traded few selected model in some product categories.
6. Details of Exports (Products/countries/value etc.)	<p>Century LED Limited has exported the below mentioned products to Oman in FY 2020-2021</p> <ul style="list-style-type: none"> • LED Batten • LED Lamp • LED Panel
7. No. of employees	150 (On-role)
8. Directors and their contact details (phone, e-mail, location etc)	<p>Mr. Gopal Singh (9051310333) E-mail: gopal.singh@centuryled.in</p>
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	<p>a. Mr. KM Prem Sundar (9176111032), Designation-Senior Vice President (Sales) E-mail: km.premundar@centuryled.in</p> <p>b. Same as above</p> <p>c. Mr. Tushar Maity (9073677559), Designation: Factory Head E-mail: tushar.maity@centuryled.in</p>
10. Regional Offices – Contact person / address	<p>Kolkata (Head Office)-P-15/1, Taratala Rd, CP Colony Century House 3rd Floor, Taratala, Kolkata, West Bengal 700088 Contact Person: Mr. Amitava Majumder (9830990154)</p>
11. E-mail	customercare@magiklight.com



LEDCHIP INDUS PVT LTD

29AB ,2F, ELECTRONIC COMPLEX, KUSHAIGUDA, HYDERABAD 500062
Tel: 9000081171, 7981230551, E-mail: sales@kwalitiyindia.com, sales@ledchipindus.com

COMPANY PROFILE:

ESTABLISHED: 2016

1. Business Domain	SMD LEDs & LED Packages, UVC LEDs, COBs, LED Modules & Light Emitting Diodes
2. Product Brand	KWALITY POLYWA, LEDchip, Kinglight
3. Manufacturing Facilities	Fully Automated High-speed LED ATMP, housed in Class10K Cleanrooms, producing SMD LEDs un-touched by human hand.
4. Products Manufactured	275nm UVC LED, Horticulture LEDs, UVA, Curing LEDs, SMD LEDs 2835, 3030, 0.2W, 1W, 3W, 5-200W in Coolwhite, Neutral White, WarmWhite, 1800-2700K, 7000-13000K, CRI 70/80/90/95, and any custom spectrum with 4-5 days production cycle time.
5. Other Products Traded	LED Materials & Assemblies with LEDchip LEDs- on request
6. Details of Exports (Products/countries/value etc.)	98% Domestic Customers Exports to Germany, UK, USA
7. No. of employees	49
8. Directors and their contact details (phone, e-mail, location etc)	1. K Vijay Kumar Gupta BSc, BE 9000081171, kvkgupta@kwalitiyindia.com
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. VARUN M - 7981230551 Email – sales@kwalitiyindia.com b. NARESH K - 81794 09843
10. Regional Offices – Contact person / address	NA
11. Any other information	Kwalitiy Photonics group is India's pioneer in LED package manufacturing since 1987, producing LM80 grade LEDs with just 1.4% degradation at 105C in 9 months test)
12. E-mail	sales@kwalitiyindia.com, sales@ledchipindus.com



CAPTAIN GEARS & FANS
D-35 SECTOR XI, NOIDA-201301/B-84 SECTOR 80, PHASE II NOIDA-201305
Tel: 9953147253, E-mail: Compact@compactlighting.net

COMPANY PROFILE:

ESTABLISHED:

1. Business Domain	Manufacturing
2. Product Brand	COMPACT
3. Manufacturing Facilities	SMT, MI, Extrusion, Fabrication, Paint Shop
4. Products Manufactured	Bulb, Battens, Panels, Flood Light, Street Light, LED Strips, Drivers
5. Other Products Traded	Fans
6. Details of Exports (Products/countries/value etc.)	NIL
7. No. of employees	200+
8. Directors and their contact details (phone, e-mail, location etc)	1. Surinder Trehan - 9350582299 Surinder@compactlighting.net B-84 Sector 80, Phase II Noida-201305 2. Chandni Sikand - 9810705505 Chandni@compactlighting.net B-84 Sector 80, Phase II Noida-201305 3. Sahil Trehan - 9810705505 Sahil@compactlighting.net, D-35 Sector XI, Noida-201301
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Chandni Sikand - Business Partner B-84 Sector 80, Phase II Noida-201305 b. Chandni Sikand - Business Partner B-84 Sector 80, Phase II Noida-201305 c. Surinder Trehan - Chief Executive Officer (CEO) B-84 Sector 80, Phase II Noida-201305
10. E-mail	Compact@compactlighting.net



CORVI LED PVT. LTD.

5T H FLOOR, NOTAN CHAMBERS, TURNER ROAD,
BANDRA WEST, MUMBAI 400050, TEL: 9833071388

E-mail: Vikrant.pathare@gmail.com

COMPANY PROFILE:

ESTABLISHED:

1. Business Domain	LED Lights Manufacturer
2. Product Brand	Corvi
3. Manufacturing Facilities	3 [Baval, Vadodara, Bhiwandi]
4. Products Manufactured	LED Lights
5. Details of Exports (Products/countries/value etc.)	LED Lights Exported to South Africa, Portugal, Spain, Kenya, UAE, Bahrain, Saudi Arabia, Egypt, Poland, Iraq, MENA Countries
6. No. of employees	34
7. Directors and their contact details (phone, e-mail, location etc)	1. Vimal Soni vimal.soni@corvi.com 2. Vijay Gwalani vijay.gwalani@corvi.com
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Vikrant Pathare Vikrant.pathare@corvi.com b. Vikrant Pathare Vikrant.pathare@corvi.com c. Dhruv Vaid dhruv.vaid@corvi.com
9. E-mail	Vikrant.pathare@corvi.com



EVEREADY INDUSTRIES INDIA LTD.

2, Rainey Park, Kolkata-700019

Tel: 033-24864961/30587822

E-mail: lighting@eveready.co.in

COMPANY PROFILE:

ESTABLISHED:

1. Business Domain	LED Lighting Products
2. Product Brand	EVEREADY
3. Manufacturing Facilities	Hyderabad & Lucknow
4. Products Manufactured	LED Lamps & Luminaires
5. Other Products Traded	LED Lamps & Luminaires
6. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	Mr. Chandra Bhal Rathour Sr. Product Manager- Lighting Business 2, Rainey Park, Kolkata-700019 E-mail: chandra.rathour@eveready.co.in
7. E-mail	chandra.rathour@eveready.co.in





INDO JAPAN HOROLOGICALS PVT LTD.

INDO JAPAN HOUSE J-1/12 BLOCK EP SALT LAKE SECTOR V
KOLKATA 700091, TEL: 033-40687043, E-mail: info@indojapan.in

COMPANY PROFILE:

ESTABLISHED: 1994

1. Business Domain	Manufacturing of LED (Semi Conductor)
2. Product Brand	INDO JAPAN LED
3. Manufacturing Facilities	SALT LAKE SECTOR V, KOLKATA
4. Products Manufactured	2835, 3030 LED, COD LED in different wattage, colour, CCT etc & UVC LED
5. Other Products Traded	NA
6. Details of Exports (Products/countries/value etc.)	Brazil - 2835 SMD LED Turkey - 2835 SMD LED Singapore & China - UVC LED
7. No. of employees	40
8. Directors and their contact details (phone, e-mail, location etc)	1. JAYA BOTHRA
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a, b&c MAYUR BOTHRA CEO Email: m.bothra@indojapan.in Address: Indo Japan House J 1/12 Block EP Salt Lake Sector V kol-91
10. Regional Offices – Contact person / address	ANKITA BOTHRA, Email: a.bothra@indojapan.in
11. E-mail	m.bothra@indojapan.in, a.bothra@indojapan.in

PROMPT SERVICES

L-141, MIDC INDUSTRIAL AREA, AHMEDNAGAR 414111, MAHARASHTRA,
INDIA, TEL: 9552002172, E-mail: marketing@eetamax.com

COMPANY PROFILE:

ESTABLISHED: 1990

1. Business Domain	Industrial Lighting
2. Product Brand	Eetamax
3. Manufacturing Facilities	Factory and Design Lab at Ahmednagar, Maharashtra
4. Products Manufactured	High Bays, Flood Lights, Street Lights, Office Lights, Clean Room Lights etc.
5. Other Products Traded	Batten, Down Lights etc.
6. Details of Exports (Products/countries/value etc.)	N.A.
7. Annual Lighting Turnover	NA
8. No. of employees	25
9. Directors and their contact details (phone, e-mail, location etc)	Dilip Joshi, Sole Proprietor, Mob - +91 9850895772 L-141, MIDC, Ahmednagar 414111, Maharashtra, India
10. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mihir Joshi (mihir.joshi@eetamax.com) b. Mihir Joshi (mihir.joshi@eetamax.com) c. Dilip Joshi (ceo@eetamax.com)
11. Regional Offices – Contact person / address	NA
12. Any other information	N.A.
13. E-mail	marketing@eetamax.com

COMPANY PROFILE:
ESTABLISHED:

1. Business Domain	Manufacturer of Power Electronics for Lighting
2. Product Brand	Just About Power, JAP
3. Manufacturing Facilities	Patparganj Industrial Area, Delhi
4. Products Manufactured	High Wattage LED Drivers & Surge Protection Devices
5. Details of Exports (Products/countries/value etc.)	SPD / Israel, Mexico, China
6. Directors and their contact details (phone, e-mail, location etc)	1. Deepak Gupta 2. Deepa Agarwal
7. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Deepak Gupta, Mob - +91-9958204111, Deepak@JustAboutPower.com
8. Regional Offices – Contact person / address	Works: 178, First Floor, Patparganj Industrial Area, Delhi 110092 Regd Office: Plot No. 34, Bhagwan Nagar, Ashram, PO, Jangpura, New Delhi 110014
9. E-mail	info@JustAboutPower.com

MERCURY LAMPS PVT. LTD.

64, Laxman Jhoola Road, rishikesh-249201 (UTTARAKHAND)

Tel:0135-2430168 & 2432168

E-mail: mlprishikesh@gmail.com; mercurylampspvtltd@gmail.com

COMPANY PROFILE:
ESTABLISHED: 2016

1. Business Domain	All India
2. Product Brand	N.A.
3. Manufacturing Facilities	Fully automatic Plant
4. Products Manufactured	GLS Lamps ranging 25W to 200W
5. Other Products Traded	N.A.
6. Details of Exports (Products/countries/value etc.)	N.A.
7. Annual Lighting Turnover	Rs. 7.00 Crores (approx.)
8. No. of employees	40 Nos.
9. Directors and their contact details (phone, e-mail, location etc)	1. Sri V.K. Agarwal, Director 2. Smt. Shobha Rani Agarwal, Director
10. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mr. S.K. Bansal, Director b. -do- c. -do- 64, Laxman Jhoola Road, RISHIKESH-249201.
11. Regional Offices – Contact person / address	NA
12. Any other information	N.A.
13. E-mail	mlprishikesh@gmail.com, mercurylampspvtltd@gmail.com

COMPANY PROFILE:
ESTABLISHED:

1. Business Domain	Consumer Electrical Goods
2. Product Brand	KWW Electricals
3. Manufacturing Facilities	Ialan Industrial Complex Gate No - 3 Argori, P.O.- Andul Mouri . Howrah. W.B: 71L302.
4. Products Manufactured	LED Lighting Products
5. Other Products Traded	Electric Fans, Home Appliances
6. No. of employees	300
7. Directors and their contact details (phone, e-mail, location etc)	1. Mr. Ajit Kumar Khaitan E : a.khaitan@khaitanwire.com M: 9830020429 2. Mr. Pradeep Kumar Khaitan E : p.k.khaitan@khaitanwire.com M:9830094691
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mr. Nitesh Khaitan E : n_khaitan@khaitanwire.com M: 9836843430 b. Mr. Nitesh Khaitan E : n_khaitan@khaitanwire.com M: 9836843430 c. Mr. Arup Sengupta E : a.sengupta@khaitanwire.com M: 9650300039
10. E-mail	n_khaitan@khaitanwire.com a.sengupta@khaitanwire.com

MITHABHI LAMPS PRIVATE LIMITED

TATARPUR ROAD, PRITHLA INDL. AREA, SECTOR-10, VILLAGE
PRITHLA-121102, HARYANA, TEL: 98101738882
E-mail: mithabhi@fokallamps.com

COMPANY PROFILE: ESTABLISHED:

1. Business Domain	fokallamps.com									
2. Product Brand	FOKAL									
3. Products Manufactured	AUTOMATIVE BULBS									
4. Details of Exports (Products/countries/value etc.)	<table border="1"> <thead> <tr> <th>PRODUCT</th> <th>COUNTRIES</th> <th>VALUE (INR)</th> </tr> </thead> <tbody> <tr> <td>BULBS</td> <td>VIETNAM</td> <td>1,95,771.60</td> </tr> <tr> <td>BULBS</td> <td>HONGKONG</td> <td>6,65,765.00</td> </tr> </tbody> </table>	PRODUCT	COUNTRIES	VALUE (INR)	BULBS	VIETNAM	1,95,771.60	BULBS	HONGKONG	6,65,765.00
PRODUCT	COUNTRIES	VALUE (INR)								
BULBS	VIETNAM	1,95,771.60								
BULBS	HONGKONG	6,65,765.00								
5. No. of employees	142									
6. Directors and their contact details (phone, e-mail, location etc)	<p>1. SUMIT MOHAN SINHA Mob no. - 9810173882 Address - H.NO.570 SECTOR-14, FARIDABAD 121007</p> <p>2. SHEELA SINHA Mob no. - 9810038824 Address - H.NO.497 SECTOR-14, FARIDABAD 121007</p> <p>3. VIDYUT SINHA Mob no. - 9810048824 Address - H.NO.497 SECTOR-14, FARIDABAD 121007</p> <p>4. M.K. SINHA Mob no. - 9810138824 Address - H.NO.497 SECTOR-14, FARIDABAD 121007</p>									
7. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	<p>a. SUMIT MOHAN SINHA Designation - Director Address - H.NO.570 SECTOR-14, FARIDABAD 121007</p> <p>b. SUMIT MOHAN SINHA Designation - Director Address - H.NO.570 SECTOR-14, FARIDABAD 121007</p> <p>c. VIDYUT SINHA Designation - Director Address - H.NO.497 SECTOR-14, FARIDABAD 121007</p>									
8. E-mail	mithabhi@fokallamps.com									

COMPANY PROFILE:

ESTABLISHED: 2011

1. Business Domain	www.technoelectromech.com
2. Product Brand	ODM/OEM Manufacturer of Led Lighting Products
3. Manufacturing Facilities	VADODARA
4. Products Manufactured	Led Lamps, Led Battens, Led Down Lights, CL 2x2 Panels, Flood Lights, Street Lights, High Bays
5. Other Products Traded	NA
6. Details of Exports (Products/countries/value etc.)	Troffers 1x4,2x2,2x4 High Bays, Street Lights USA
7. No. of employees	1500
8. Directors and their contact details (phone, e-mail, location etc)	1. Mr. Saurabh Patel,9898038261 2. Mr. Nisarg Patel,8128993261 3. Mr. Tej Patel, 8128993262
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mr. Rajesh Kalra b. Mr. Tej Patel c. Mr. Nisarg Patel
10. Regional Offices – Contact person / address	Mr. Rajesh Kalra Rohini, Delhi - 110085
11. E-mail	saurabh@technoelectromech.com tej@technoelectromech.com rajesh.kalra@technoelectromech.com

COMPANY PROFILE:

ESTABLISHED: 2020

1. Business Domain	Electrical Lighting Products
2. Product Brand	True North & C&S (as licensee)
3. Manufacturing Facilities	One Manufacturing facilities in Noida
4. Products Manufactured	LED Lamps & Batten ,LED Floodlights, LED Streetlights, LED Landscape lights, LED Building & Commercial Lights, LED Industrial lights, LED Smart Lights
5. Other Products Traded	Some SKUs of above
6. Details of Exports (Products/countries/value etc.)	SAARC & African Countries, ME, EU, etc. Same products as above. About 5% of our turnover.
7. Annual Lighting Turnover	NA
8. No. of employees	250
9. Directors and their contact details (phone, e-mail, location etc)	Mr. Rishi Nath Khanna (MD) Address – 222, Okhla Industrial Estate, Phase -3 , New Delhi – 110020 Email – info@true-north.co.in, PH – 011-69049000-09
10. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mr. Rajeev Jindal (Business Head) b. Mr. Devashish Biswas c. Mr. Sandeep Belsare
11. Regional Offices – Contact person / address	NA
12. Any other information	NA
13. E-mail	info@true-north.co.in



KESELEC LIGHTING PRIVATE LTD.

210 Charmwood Plaza| Eros Garden Colony|Charmwood Village | Near Suraj
Kund Road | Faridabad | Haryana-121009 | India, Tel: +91 129 411 7388
E-mail: mayankkg@keselec.com

COMPANY PROFILE:

ESTABLISHED:

1. Business Domain	Lighting Solutions and Smart Controls
2. Product Brand	Keselec
3. Manufacturing Facilities	Keselec Lighting Private Limited 55 Industrial Area NIT Faridabad Haryana – 121001 India.
4. Products Manufactured	LED Luminaires, Poles & Brackets and Smart Controls.
5. No. of employees	100
6. Directors and their contact details (phone, e-mail, location etc)	1. Chekitan Sawhney, Managing Director chckitan@keselec.com 2. Mayank Gupta, CEO mayankkg@keselec.com
7. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	1. Chekitan Sawhney, Managing Director chckitan@keselec.com 2. Mayank Gupta, CEO mayankkg@keselec.com
8. E-mail	mayankkg@keselec.com

M/S AROSON PLASTICS PVT. LTD.

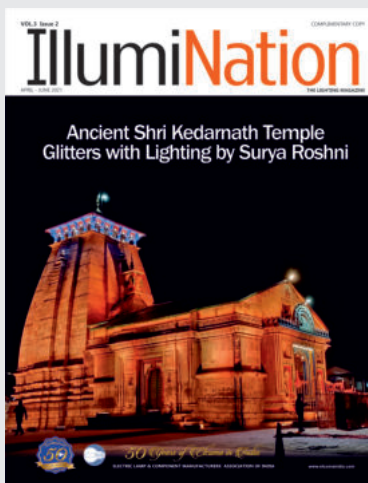
B-90, Mayapuri industrial area, phase-i, New Delhi-110064 (India)
TEL: 011-28116777 & 78, FAX: 011-45501100, E-mail: info@arosonglobal.com

COMPANY PROFILE:

MANUFACTURER OF PRECISION MOULDS, COMPONENTS & ASSEMBLIES WITH SPL. IN COMPLETE LED PRODUCTS & ELECTRICALS ASSEMBLIES.

ESTABLISHED: 22.12.2005

1. Business Domain	Manufacturing & Assembling
2. Product Brand	Aroson LED
3. Manufacturing Facilities	Complete setup under one roof
4. Products Manufactured	Precision Moulds, Components & Assemblies
5. Other Products Traded	Complete LED products & Electricals Assemblies
6. Details of Exports (Products/countries/value etc.)	Under planning
7. Annual Lighting Turnover	25-50 Crores
8. No. of employees	83
9. Directors and their contact details (phone, e-mail, location etc)	1. Mr. Amrik Singh - 9891699999 Email ID: amrik@arosonglobal.com 2. Mr. Saheb Singh – 9871892222 Email ID: saheb@arosonglobal.com 3. Mr. Tirlochan Singh – 9910398887 Email ID: ts@arosonglobal.com
10. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mr. Amrik Singh (Mg. Director) b. Mr. Saheb Singh (Director)
11. Regional Offices – Contact person / address	D-37, Bahadradab Industrial Area, Haridwar-249403 (Uttarakhand)
12. Any other information	The Company is registered, certified and approved from all required bodies
13. E-mail	info@arosonglobal.com



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Electric Lamp and Component Manufacturers' Association of India
122, 1st Floor, DLF Tower-A, Jasola District Centre, Jasola Vihar, New Delhi -110025
Tel: +91-11-41556644/46604947



LIGHTING TECHNOLOGIES INDIA PRIVATE LIMITED

NO. 40, JIGANI INDUSTRIAL AREA, I PHASE, SY. NO. 592 & 124, JIGANI VILLAGE & HOBLI, ANEKAL TALUK, BANGLORE 560105 KARNATAKA, INDIA
 TEL: 080 66556655, FAX: 080 66556655 E-mail: infor.india@ltcompany.com

COMPANY PROFILE:

ESTABLISHED:

1. Business Domain	Manufacturing of LED Lights
2. Product Brand	LT
3. Manufacturing Facilities	Diecas
4. Products Manufactured	LED Luminaires & Drivers
5. Other Products Traded	NA
6. Details of Exports (Products/countries/value etc.)	LED Luminaires / Middle East / Approx 10Cr
7. Annual Lighting Turnover	MSME 100Cr
7. No. of employees	165 on role & 300 Contract role
8. Directors and their contact details (phone, e-mail, location etc)	<ol style="list-style-type: none"> 1. Mr. Gopakumar Pazhdath, gkumar@ltcompany.com, Russia 2. Mr. Ninkileri Thazhillath Satish, satish@ltcompany.com, Russia 3. Mr. Sergei Ivanov, s.ivanov@ltcompany.com, Russia 4. Ms. Uliana Nikolaevna Tikhonova, u.tikhonova@ltcompany.com, Russia 5. Mr. Harinarayanan K V, hari.nkv@ltcompany.com, India
9. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	<ol style="list-style-type: none"> a. Mr. Kalaiselvan K. Sr. Gm - Pm & Special Segment Sales, k.selvan@ltcompany.com b. Mr. Kalaiselvan K. Sr. Gm - Pm & Special Segment Sales, k.selvan@ltcompany.com c. Mr. Jayakanth Ganesan. Gm - Manufacturing Operations, jayakanth.g@ltcompany.com
10. E-mail	info.india@ltcompany.com

COMPANY PROFILE:
ESTABLISHED:

1. Business Domain	LED Lighting Products
2. Product Brand	SYSKA
3. Manufacturing Facilities	Rabale Mumbai & Chakan, Pune
4. Products Manufactured	LED Bulb, LED Downlight, LED Tube Light, LED Street Light, LED Beam Light, LED Hi bay light
5. Details of Exports (Products/countries/value etc.)	All LED Products UAE, African Countries, South East Asia, Philippines
6. No. of employees	1600
7. Directors and their contact details (phone, e-mail, location etc)	1. Mr. Govind Uttamchandani 2. Mr. Rajesh Uttamchandani Tel: 0204013100
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	a. Mr. Swapnil Shinde, Asst. Vice President b. Mr. Ajay Mehra, Sr. Vice President c. Mr. Sunil Gaikwad, Sr. Vice President
9. Regional Offices – Contact person / address	Mumbai Office: Contact Person: Mr. Vishal Chabria Syska LED Lights Pvt. Ltd., 601, 6th Floor, Center Point, A. K. Road, Near Chakala Metro Station, Andheri East, Mumbai - 400059 Delhi Office: Contact Person: Mr. Dhruv Singh Syska LED Lights Pvt Ltd 609-610, 6th Floor, DLF Tower Moti Nagar, New Delhi - 110034
10. E-mail	swapnil.s@sskgroup.in



FLUXLITE NIMS PRIVATE LIMITED

Plot No. G976-979 B, C, D, G-986-To G-991, Sitapura Industrial Area, Phase 3, Jaipur-302022, TEL: 0141-2771980
E-mail: chancellornims@gmail.com, cmdfluxlitenims@gmail.com, deepaknathiya@gmail.com

COMPANY PROFILE:

ESTABLISHED: 2016

1. Business Domain	LED Light manufacturing & Marketing
2. Product Brand	NiFLUX
3. Manufacturing Facilities	<p>SMT -4 Lines</p> <p>MI Conveyor Setup with Wave soldering -2 Lines</p> <p>Assembly Conveyor setup -6 Lines</p> <p>Aging Conveyor setup -8 Lines</p> <p>Packing Conveyor setup -4 Lines</p>
4. Products Manufactured	<p>LED Bulbs (0.5W to 50W)</p> <p>LED Battens (5W - 30W)</p> <p>LED Down Lights (3W - 20W)</p> <p>LED Flood Lights (10W - 200W)</p> <p>LED Street Lights (15W - 120W)</p> <p>& many more.... @www.fluxlitenims.com</p>
5. Other Products Traded	Fluxlite NIMS Pvt Ltd, INDIA has sister concerns in ITALY, USA, CANADA, UK & SPAIN with same Brands Niflux & sales there LED Filament bulbs, T-5/T-8 LED tubes, LED Panel Lights, CoB Down lights, LED Hi Bays, LED Street Light & LED Flood Lights.
6. No. of employees	50+ 500
7. Directors and their contact details (phone, e-mail, location etc)	<p>1. Prof. (Dr.) Balvir S. Tomar - CMD</p> <p>2. Dr. Juhi Tomar - Director</p>
8. Contact Persons for a. Business Development b. Exports c. Production (With names, designation & Addresses)	<p>a. Mr. Atul Bansal</p> <p>b. Mr. Deepak Nathiya</p> <p>c. Mr. Pradeep Chandraker</p>
9. Regional Offices – Contact person / address	<p>Mr. Deepak Nathiya</p> <p>Same as above factory address</p>
10. E-mail & Contact Number	<p>pradeep@fluxlitenims.com, 9929011611</p> <p>caatulbansal@gmail.com, 9829022279</p> <p>deepaknathiya@gmail.com, 9929600137</p>



STELLUX-P



STYLO Q

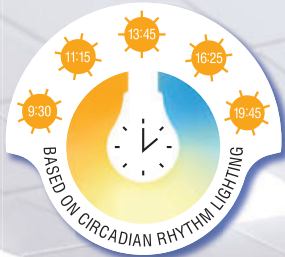


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Reduces Stress



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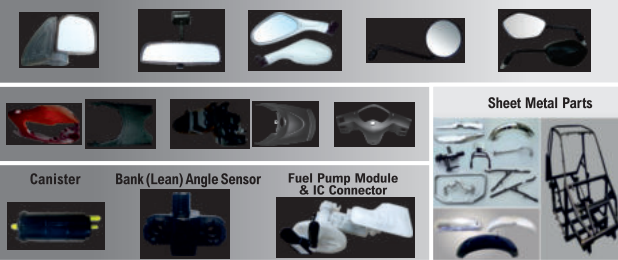
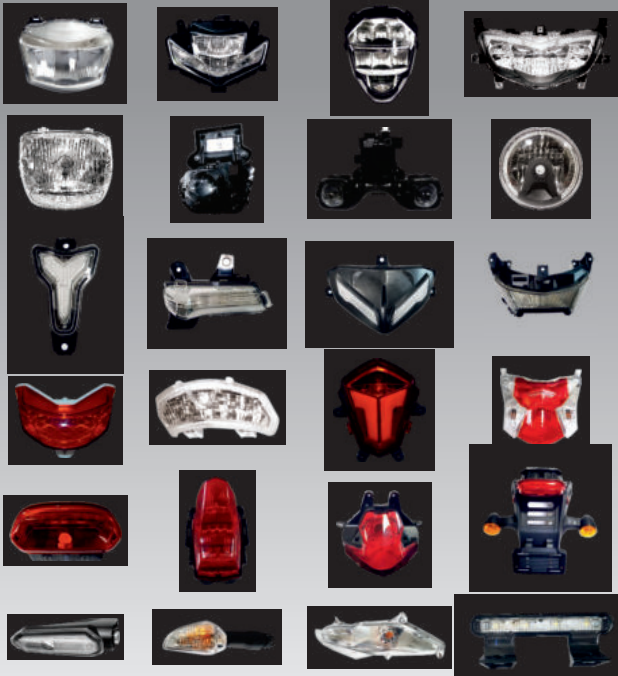
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- Integrated Passenger Information System with Display & Software for Railways and Buses (IPIS)



LED AUTOMOTIVE LIGHTS



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Corporate Office: Aria Commercial Tower, Unit 1A & 1C, 1st Floor, JW Marriott Hotel, Aerocity, New Delhi - 110037

R&D/Design Centres: India (Rai-Haryana), Japan, Italy | Units: Haryana, Rajasthan, Himachal Pradesh, Tamil Nadu, Karnataka & Gujarat

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Gauri Khan

Gauri Khan
Interior Designer



COLLECTION Spanish

Live the Bohemian life

The Spanish Collection, a fusion of glassmaking traditions & cutting-edge technology, brings to life the magic of Bohemia Glass with exclusive handcrafted chandeliers.

ADELINA



COLLECTION Italian

The Romance of Murano Glass

A Connoisseurs dream, teased to life by master craftsmen, in the centuries old tradition of Murano Glass, the collection is empowered with state-of-the-art technology for high energy efficiency.

DALIA

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Focused not just on the science and art of lighting but also on the art of well-being, TISVA's tunable and dimmable lights are human centric in nature, helping people adjust their daily lives to natural circadian rhythms.

Tisva lights empower you to control the colours and intensity within your treasured space to increase productivity, enhance mood and improve the over-all well-being of our lives.



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Discover the perfect lighting for work spaces with Tisva's range of architectural lights.

”

Transforming the way we live, with Connected Lighting

Bringing your smart home to life with Philips Hue



Changing the way you shop with Indoor Positioning System



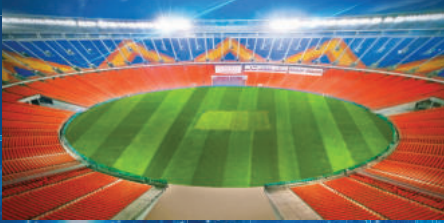
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Making cities smarter, safer and responsive with Interact City



Creating exhilarating fan experiences in stadiums with Philips ArenaVision LED floodlighting system



Improving productivity and operational efficiency with Interact Office - an IoT platform



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