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of the **indian society of lighting engineers**

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FROM THE PRESIDENT'S DESK

It gives me great pleasure to wish you and your families a very happy new year. It really does give me pleasure because it is not just an empty salutation that one routinely makes at the beginning of every year. For those of us in the business of lighting, life continues to be bright with a buoyant and growing market and the prospects of a happy new year are indeed very good.

But more importantly for us in ISLE, committed to promoting good lighting practice, life also seems to be looking up. The government is seriously committed to implementing energy saving in lighting. As the only technical platform for lighting in India, it is up to us to help in the wider understanding and implementation of the new energy saving technologies in lighting.

There is also an interest in other wings of the government in good lighting practice. For example, the Ministry of Tourism is looking for creative ways to use lighting to enhance the attraction of tourist destinations. Mr. Mamak has already had several meetings to work out the modalities of how this could happen. This is an opportunity for ISLE to promote good lighting design and to bring more architects and interior designers into our fold.

From the new year message of the CIE President, Mr. Wout van Bommel, you will see that how important it is for us to get more active in the technical work of CIE if we wish to be part of the new emerging and rapidly changing technologies and concepts in our field.

It is in this context that I feel that 2006 brings us new opportunities in all areas of lighting. And it is important that we grasp this opportunity and make the most of it. I do find it a little worrying to observe that since September there have been only a few ISLE programmes and I hope that this is just a passing phase in the aftermath of Lii2005.

All State and Local Centres now need to activate their members and hold more technical programmes. I am sure that we in ISLE will seize the moment and look forward to an enhanced level of activity in the course of the coming year.

With good wishes to you all.

S. Venkataramani
President

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EDITORIAL

This first issue of your newsletter opens with the sad news of the passing away of Jozsef Horvath. He was a friend of ISLE and we will miss him.

We continue to receive appreciation for the events and activities at Lii2005. And this includes the spectacular indoor and outdoor light and laser shows sponsored and executed by Modern Stage Service. The images on page 31 will give you an idea of why the Delhi crowds just loved them.

Because of the great interest shown we have by popular demand reproduced two of the articles from the Directory of the Lighting Industry in India. One is an excellent article on Luminaires by Ranjan Ghosh Dastidar and the other on lighting and health issues in schools by Henri Juslen. In addition we have an article on the current state of the development of LEDs by one of the world's leading experts in the field, Luc van der Poel from The Netherlands.

There is a report on Vision 2006 which was organized jointly by the Karnataka State Centre in collaboration with SISI and KASSIA.

There is information on 4 new CIE Publications. These are now easily available through the CIE webshop and ISLE members are entitled to a 50% discount on the list price. Please contact the Delhi Secretariat for help with your orders.

In the last issue of the newsletter, we published the call for papers for the CIE Session in Beijing next year. In case the issue is not handy you can check out the details at www.cie.co.at. At the last Session in San Diego it was disappointing that there was only one paper from India. Considering the fact that India has several experts who are respected both in the country as well as internationally, it would be in our interest to have at least half a dozen papers at Beijing.

H.S. Mamak
Editor

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OBITUARY

Dr. Jozsef Horvath
1940-2005

In mid December 2005 the international lighting community was shocked to receive the sad news of the unexpected death of Dr. Jozsef Horvath. He was 65.

Dr. Horvath was a well known and highly esteemed lighting professional. Many ISLE members came to know him because of his position in the CIE. He attended the CIE Session in New Delhi in 1995.

In his youth in Budapest, Hungary, Jozsef Horvath developed a lifelong interest in Lighting, Architecture and Jazz. From a serious hobby, Lighting became his profession, field of expertise and brought him a worldwide reputation.

He was one of the Board members of the Budapest Lighting Department and the Director, Lighting Systems Division, Tungsram, Hungary. When Tungsram and Schreder started a joint venture, Dr. Horvath became the President of Tungsram Schreder.

In the CIE, he represented Hungary as a Principal Member in the General Assembly and as a Member in the Division 5 Exterior and Other Lighting Applications. In 1995, he became the Director of the Division 5 and retired from that position in 2003. He was a Member of several Technical Committees and chaired the Technical Committee that brought out the CIE Publication 129: 1998 Guide for Lighting of Exterior Work Areas. When it was decided to bring out a Joint CIE/ ISO Standard on the same subject, he continued supporting this activity, which is now at an advanced stage.

For me personally this is a great loss. Jozsef was a good friend and a fine human being with cultured and refined tastes. It was such a pleasure to work with him closely as a fellow member of the CIE Division 5 and of several Technical Committees. I was in the Divisional Management with him, when he invited me to be the Secretary of the Division 5 in 1995 and retired with him. Those eight years were very productive and while sharing our views on all those CIE documents during the drafting and finalization stages, I admired his meticulous style of working. It was a happy coincidence that the CIE Publication 128: 1998 Guide to the Lighting for Open Cast Mines prepared under my TC Chairmanship was printed simultaneously with Jozsef's Guide.

Jozsef Horvath was also a great friend of India. ISLE members, who accompanied me to the CIE Session at Melbourne in 1991, must still remember the happy moment, when India won the bid to hold the 1995 Session

against stiff competition from countries much more active and better known in CIE circles. It happened because of the support of many friends. Jozsef was one of them, but with a difference. He offered spontaneous support, even before I could ask.

I also came to know Mrs. Horvath and their daughter having met them during several CIE meetings. They came to New Delhi in 1995. May God give the family of Jozsef the strength to bear this grief.

Jozsef Horvath published an excellent book on the Lighting of Budapest, a copy of which he presented to me. I am sure those beautifully illuminated buildings and other landmarks will remain as a fitting memory of him.

May Jozsef's soul illuminate the other world.

Pranab K Bandyapadhyay

KARNATAKA STATE CENTRE

Vision 2006

December 9-11, 2005, Bangalore

Mr. Ludu cuts the ribbon to inaugurate the exhibition

ISLE Karnataka State Centre joined hands with the Small Industries Service Institute, Bangalore and KASSIA to organize an Exhibition and Vendor Development Programme for the Lighting and Allied Electrical Industries at the SISI Campus in Bangalore.

The programme was aimed at creating a platform for interaction and mutual education between the large and small scale industries in this field.

There were 66 stalls for the display of products, equipment and services. During the three days the accompanying technical seminars gave an opportunity for interaction between large and small scale industries covering a wide range of issues: new technologies, standardization, certification, bench marking, taxation and finance issues, SSI economics, marketing problems, product development, exports, intellectual property rights etc. Invited speakers and specialists were drawn from large and small scale manufacturers, standardisation and certification organizations, academic and research institutions, government and financial institutions.

Mr. Sanaullah lighting the lamp

Mr. Sameer Inamdar

The Inaugural Session was introduced by Mr. M.S.N. Swamy, Secretary, Karnataka State Centre. The following dignitaries participated in this session: Mr. K.S. Ludu, Additional Development Commissioner, DCSSI, Mr. Mohammed Sanaullah, Government of Karnataka, Mr. S.S. Dhillon, SISI Bangalore, Mr. Veerabhadraiah, MD KCTU, Mr. H. Hegde, President KASSIA and Mr. Sanjay Jadhav, Chairman, Karnataka State Centre. Mr. Sameer Inamdar, Head of GE Lighting in India gave the keynote address. Mr. M.G. Sathyendra of ISLE gave the vote of thanks.

CIE ACTIVITY

CIE and Globalisation

Since I was inaugurated as CIE president in San Diego (USA) in July 2003, I have tried to visit as many National Committees and would-be National Committees as possible. This brought me to many countries in Europe - Bulgaria, Slovakia, Poland, Denmark, Germany, Belgium, UK, Italy, Spain and Russia, and in Asia - China, Japan, South Korea, Hong Kong, Singapore, Malaysia, Thailand and Indonesia, and to South Africa. In the first week of January 06 I will join the celebrations of 100 years of IES of North America and later that year South America is on the programme.

In all these countries I met enthusiastic lighting and image-technology people. It is surprising to note that wishes, problems and solutions that people have in our field are often very similar. Indeed, lighting and image technology has become a truly international fair. All over the world I hear that people want CIE to act more swiftly, to communicate efficiently about all matters related to our subject, and to make its publications more readily available.

As far as the last-mentioned aspect is concerned, during the past six months I have received many compliments on the new CIE On-Line Webshop, which permits the direct download of CIE publications as PDF files (payment by credit card). Some NCs were very enthusiastic about being able to bookmark the CIE On-Line Webshop to easily access non-CIE lighting-related publications (for example, those of ISO, IEC and IESNA)

by going from the CIE Webshop directly to these organisations (who make use of the same, TechStreet, facilitator). Some NCs are also asking that our Webshop be made available for publications from the NCs themselves, so creating from the CIE Website THE INTERNATIONAL SITE with all information, national or international, in the field of light, lighting and image technology. Once we have had more experience with our Webshop, we shall certainly study such possibilities.

For many people active in the NCs, one of the most important benefits affered by CIE is the ability to make use of the international network of the world's top experts in our field. In this respect, I urge all Division Directors and Division Secretaries to have up-to-date lists of Division and TC members available (preferably on the CIE Divisional websites).

Making use of such an international network is becoming increasingly more important and advantageous because we are witnessing strong globalisation effects in the lighting and image-technology fields.

Of course, part of the lighting industry is already international, the lamp industry being an example. And right from the very beginning, the image-technology field has been an international business. The light-measuring industry, too, has long been quite an international business, while the luminaire industry is now moving on from being a mainly national or regional business towards a more global business.

Many independent lighting consultants are also becoming very much more involved in international projects. For these groups it is "annoying" and inefficient if different countries have widely different recommendations or standards in our field. This is a strong argument for them to join CIE as volunteer experts in one of our many TCs and/or as supporting members of CIE.

The research institutes and universities are building up impressive worldwide exchange programmes for students and for visiting professors. Here, too, it helps that CIE promotes the same basics and concepts, so that exchange becomes easier and more efficient.

In this changing world of globalisation, the role of CIE as a truly international body should become more and more important. The globalisation of our world also requires that we adapt to more and faster changes. Probably the best example is the LED industry, a semi-conductor industry where changes are taking place very rapidly indeed. Whereas it took some sixty years for the efficacy of the fluorescent lamp to be increased from some 40 lm/W since its introduction in the late thirties to the 100 lm/W of today, it is predicted that white LEDs, today with an efficacy of around 30 lm/W, will reach the value of 100 lm/W somewhere between 2008 and 2010, which is just two to four years away!

Standardisation within the field of lighting is urgently required to keep pace with the speed of expansion of the industry itself. Fortunately, CIE Divisions 1 and 2 have already shown that in the LED field we can produce both quickly and with good quality. Another example where we have to move fast is the challenging field of the non-visual biological effects of lighting. Here the challenge is to bring the expertise from many different disciplines (medical, biological, psychological and lighting) together so as to be able to design lighting installations that are optimal from the visual, emotional (architectural) and health points of view.

To sum up: our world is becoming smaller. This is due in part, of course, to the speed and easiness of world travel, but also because of the availability of internet and Email. Users of lighting, producers of lighting and image technology, and researchers, are all calling for international concepts: and they want them now! Many fantastic new technologies and concepts now evolving are calling for reactions from CIE. We are in part well equipped to answer this call, but there remain areas where continuous change is needed. Quite an interesting challenge, and an opportunity for CIE to show that it is up to it.

I wish all CIE volunteers, staff, and their families the very best for 2006.

Wout van Bommel,
President of the CIE

The 26th Session of the CIE
4-11 July 2007 Beijing, China

	Conference				Divisional meetings		
	Wed 4 July	Thu 5 July	Fri 6 July	Sat 7 July	Mon 9 July	Tue 10 July	Wed 11 July
a.m.	General Assembly	3 Invited Papers in Plenary Session 3x8 Presented Papers in 3 parallel sessions			Divisional meetings, up to 3 parallel sessions, and		
p.m.	General Assembly	2 Poster viewing sessions 3x2 Workshops			Technical Committee meetings Technical tours		
evening	Cocktail	Cultural	Banquet	City Night tour			Farewell Dinner

Call for papers

The 26th Session of the CIE will be held in Beijing, China, from 4 to 11 July 2007.

For details see Vol. V No. IV or log on to
www.cie.co.at

New TCs

The following new TC was established:

TC 6-60 "Spectral weighting of ultraviolet radiation from solar surrogate sources"
Chair: Don Forbes, USA)

Terms of Reference: To prepare a document intended to provide health research scientists with a concise reference for estimating the risk associated with exposure to various levels of radiation from solar surrogate sources.

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Division 2
Activity Report

Division Officers
Director: Miss Teresa Goodman
Associate Directors: Dr. Georg Sauter Mr. Nobert Johnson Mr. Guy Vandermeersch
Editor: Dr. Jim Gardner
Secretary: Dr. Yoshi Ohno

TC2-16 Characterization of the performance of tristimulus colorimeters
Chair: M. L. Rastello (Italy)

Terms of reference: To produce a report recommending methods for assessing the performance of tristimulus colorimeter heads for measuring chromaticity coordinates.

Status: Janos Schanda has agreed to take over the TC to finish the TC report draft and to go through the ballot process.

TC2-17 Recommendation for integrated irradiance and spectral distribution of simulated solar radiation
Chair: G. Zerlaut (USA)

Terms of Reference: Revise and update CIE Publication No.20 (1972)

Status: A new TC Chair was agreed in San Diego, who has an ambitious programme for the progress of this TC.

TC2-19 Measurement of the Spectral Coefficient of Retroreflection
Chair: N. Johnson (USA)

Terms of Reference: Identify the critical measurement parameters, tolerances, and requirements for, and conduct an international intercomparison of, the spectral coefficient of retroreflection.

Status: The draft is nearly ready for TC ballot. The main output from the measurements is chromaticity. Several specification standards specify chromaticity limits and these mean that some revisions are needed to the report to take account of these limits and the associated measurement uncertainties. There is a strong link with D4 on surface colours for signalling and it had been anticipated that limits would be added to the relevant documents for retroreflective surfaces.

TC2-23 Photometry of Street-Lighting Luminaires.
Chair: G. Vandermeersch (Belgium)

Terms of Reference: Prepare a technical report on the photometry of street lighting luminaries.

Status: The TCC had a meeting with interested people and, as decided in San Diego, new recommendations will be included in an amendment of publication 121. The work will be done within TC2-23.

TC2-25 Calibration Methods and Photoluminescent Standard for Total Radiance Factor Measurement
Chair: J. Zwinkels (Canada)

Terms of Reference: Prepare a CIE report on methods for measurement of total radiance factors of photoluminescent materials. Recommendations for realizing and calibrating photoluminescent standards by the one and two-monochromator methods will be included.

Status: The TCC has largely completed the revision of the TC report, incorporating the recommendations from the San Diego meeting. The fluorescence vocabulary terms from TC 2-25 were sent to the D2 Editor for inclusion in the revised ILV. Upon request from the CIE CB, the CIE draft standard DS012.2E "Standard method of assessing the spectral quality of daylight simulators for visual appraisal and measurement of colour", prepared by TC 1-53, was reviewed with regards to clarifying the fluorescence terminology. Recommendations were made and accepted to revise the terminology to be consistent with the usage in TC 2-25.

TC2-28 Methods of characterizing spectrophotometers
Chair: P. Clarke (UK)

Terms of Reference: Write a CIE report on the characterization of spectrophotometers by means of reference materials and other methods, with particular reference to linearity, wavelength error, stray light, and integrating sphere errors.

Status: The document is almost finished and needs only editorial finishing.

TC2-29 Measurement of Detector Linearity
Chair: T. Larason (USA)

Terms of Reference: Prepare a CIE guide on methods for the characterization of the linearity of detectors of optical radiation, including different principles by which

the linearity of detectors can be determined and causes of non-linear behavior, to aid users of optical radiation detectors in the selection and use suitable devices for specific applications.

Status: The TCC distributed the changes agreed upon at the meeting in San Diego and received comments from the committee members. A second draft has been distributed.

TC2-32 Measuring Retroreflectance of Wet Horizontal Road Markings
Chair: N. Hodson (USA)

Terms of Reference: To prepare a guide for the methods of measuring coefficient of retroreflected luminance (specific luminance) of horizontal road markings under wet weather conditions.

Status: Additional discussion will be needed on how to include raised pavement markings in the next draft.

TC2-35 CIE Standard for V(λ) and V'(λ) CHECK
Chair: K. Mielenz (USA)

Terms of Reference: To prepare a new CIE Standard on the present V(λ) and V'(λ) functions.

Status: The TC report, CIE DS 010.3/E:2002 – The CIE System of Physical Photometry went through NC ballot in Dec. 2001 and the negative vote on the radiance definition was resolved in 2003.

The Editor and Secretary worked with DD to complete the editing and sent the final version to CIE CB.

TC2-37 Photometry Using Detectors as Transfer Standards
Chair: Y. Ohno (USA)

Terms of Reference: To prepare a report on the properties of *V*(λ)-corrected detectors that are suitable for disseminating and maintaining photometric units. This report will include methods for the use of these detectors.

Status: The TCC completed the 7th draft in the CIE report format, sent it to the Editor for checking the format and editing, and distributed to TC members for TC ballot. If no new issues are raised, the TC report will be sent for aproval by Division ballot.

TC2-39 Geometric Tolerances for Colorimetry
Chair: D. Rich (USA)

Terms of Reference: Compile a technical report and recommendations specifying the geometric tolerances for the various geometries in colorimetry, including 0/45, 0/d and others. Parts of this technical report may be suitable for inclusion in a CIE standard specifying several geometric tolerance levels.

Status: At the San Diego meeting, a consensus was finally reached concerning the way to assess conformance of an integrating sphere. A new draft was prepared and distributed to committee members for approval in the spring of 2004. Replies were to be received by the D2 meeting in Japan. There have been no new contributions or negative comments from the committee. It is thus the intent of the TCC to review the current draft for style and form and then submit to the DD and Editor.

TC2-40 Characterizing the Performance of Illuminance and Luminance Meters
Chair: R. Rattunde (Germany)

Terms of Reference: Convert the present CIE Technical Report No. 69 into an ISO/IEC standard. Prepare a combined CIE/ISO standard describing the definitions of quantities influencing the performance of illuminance and luminance meters, as well as defining measurement procedures for the individual error quantities.

Status: The TCC plans to finish the next draft version and have discussion on e-mail reflector. The TC lost a few members and membership list is to be revised. New members are invited.

TC2-42 Colorimetric Measurements for Visual Displays
Chair: C. Wall (UK)

Terms of Reference: To produce a Technical Report summarizing recommended practice for the measurement of the colorimetric and spectroradiometric properties of visual displays.

TC2-43 Determination of measurement uncertainties in photometry.
Chair: G. Sauter (Germany)

Terms of Reference: To prepare a CIE recommendation as the basis for the determination of measurement uncertainties valid for selected quantities used in photometry.

Status: The draft is basically completed, although format of the worked examples and possible calculation templates are still to be finalized. During the TC meeting the TCC proposed that uncertainties of the spectral values should be considered in the calculation of distribution temperature; i.e., the differences between two curves should be weighted by the inverse square of the uncertainty value of each point in order to obtain the best estimate (based on statistical theory). Ohno raised a concern that this would be a change of the definition given in CIE 114/4, and that, if this change was recommended, it would be possible to obtain two different answers from the same spectral data, depending on whether weight is applied or not. This would cause serious confusion. After a lengthy discussion, it was agreed that this recommendation (to weight the spectral values according to the associated

uncertainty) should be included in the TC draft, and also that a recommendation should be made to add a note to this effect in the revised ILV. After the TC meeting, however, Ohno noticed a problem that the use of weight would give unreasonable results if the uncertainty values are much smaller than the deviation of the SPD curve from Planckian (see example EXCEL sheet – posted on the website). This issue was raised again in the D2 meeting, and as a result a reportership was established (see R 2-35).

TC2-44 Vocabulary Matters
Chair: J. Gardner (Australia)

Terms of Reference: To provide liaison between Div.2 and TC 7-06 "Lighting Terminology" and support the preparation of the new edition of the Lighting Vocabulary in the field of light and colour measurements.

Status: As the Editor changed, the chairperson of the TC also changed to J. Gardner. The report on the ILV revision was covered in the Editor's report. It was agreed that this TC should continue even after the ILV revision is published, to collect and maintain a list of new terms.

TC2-45 Measurement of LEDs - Revision of CIE 127
Chair: K. Muray (USA)

Terms of Reference: Revise CIE Pub. 127 to include improved definitions of quantities and methods of measurement for total flux and partial flux of LEDs and to re-evaluate other parts including spectral and color measurements of LEDs.

Status: The new draft has a lot of additions as compared with CIE 127, including new methods for evaluating the $V(\lambda)$ match of photometers, the definition of Partial LED Flux, recommended geometries for integrating spheres, introduction of the use of spectroradiometers for photometric measurements as well as color measurements, etc. At the meeting in Tokyo, some of the new additions were discussed. There was a proposal by Schanda for another method for evaluation of the $V(\lambda)$ match of photometers (presented at the Symposium), in addition to the two methods already proposed in the draft. Attendees seemed to prefer Schanda's method to the other two methods. The TCC and Ohno will investigate this method further. The TC also discussed the Partial LED Flux and agreed on the definition in the current draft. The TCC requested further comments on Draft 4 by e-mail to produce the next draft.

TC2-46 CIE/ISO standards on LED intensity measurements
Chair: John Scarangello (USA)

Terms of Reference: To prepare a CIE/ISO standard on the measurement of LED intensity measurements based on the CIE Pub. 127.

TC2-47 Characterization and Calibration Methods of UV Radiometers
Chair: Gan Xu (Singapore)

Terms of Reference: Prepare a CIE recommendation on methods of characterization and calibration of broad-band UV radiometers in the spectral ranges of UVA and UVB for industrial applications.

Status: The TCC resigned earlier this year due to changes in his work responsibility at his organization. He apologizes for his resignation but believes that the TC work is still very important for the UV community and hopes the TC work can be continued by a new chairman. He is willing to help transferring the TC work to whoever can take over. DD will try to find someone from NPL (UK) to continue this TC.

TC2-48 Spectral responsivity measurement of detectors, radiometers, and photometers
Chair: G. Eppeldauer (USA)

Terms of Reference: To rewrite the technical report CIE 64 (1984) "Determination of the spectral responsivity of optical radiation detectors" to update device and measurement technology, and include the spectral irradiance and radiance responsivity measurement for radiometers and photometers from UV to near IR.

Status: In Tokyo the 6th draft was presented and discussed. In the new draft, Chapter 6 has been extended with sub-chapter 6.4 on Filter Radiometers. Section 6.1 on monochromators is being extended by Palmer (USA) and he is also writing Section 6.3 on the Use of Narrow Bandpass Filters. Section 6.2 on Uniform sources is to be written by TCC. Chapter 8 on References has been added and it is being extended. Chapter 2 on Definitions is also being extended and the Terminology is being improved. The sub-chapters on Uncertainty need to be extended to include aspects related to correlation - Sauter volunteered to do this. The uniformity of the document is to be improved. Suggestions were made by Jiangen Pan to modify Figs. 2, 3, and 17, and also by Richard Distl to improve Figs. 17 and 18. (Draft 6 is now posted on the website for TC members).

TC2-49 Photometry of Flashing Light
Chair: Y. Ohno (USA)

Terms of Reference: Produce a technical report for photometric measurements of flashing light, including derivation of the photometric quantities applied to flashing light, measurement of light sources, and calibration of photometers for flashing light.

Status: At the 2002 meeting, the focus was on the definition of effective intensity and standardization of the formula, which would need further visual experiments coordinated with D1. The TCC, however, has not found

any member or group that plans to perform such experiments. Rattunde suggested that the TC should not wait for further experiments but rather complete the TC report with the current knowledge available, without recommending a single method for effective intensity. The TCC agreed with this suggestion, but emphasized that there is a strongly need for a standardized definition for effective intensity.

TC2-50 Measurement of the optical properties of LED clusters and arrays

Chair: G. Sauter (Germany)

Terms of Reference: To produce a technical report for the measurement of optical properties of visible LED arrays and clusters, to derive optical quantities for large LED arrays and recommendations for measurement methods and conditions.

Status: It was agreed that many properties of LED arrays and clusters can (and therefore should) be measured in the same way as classical lamps. The TC should concentrate on quantities, effects or operating conditions where LED arrays and clusters have peculiarities. These are: 1. Measurement of luminance. 2. Effects of heating/ self-heating. 3. Chromaticity. 4. Amplitude modulation. The scope should include signs and static displays, while dynamic displays are excluded. The TC member list will be reformed based on responses from the participants. An email reflector will be set up for continuing discussions.

TC2-51 Calibration of multi-channel spectrometers

Chair: R. Austin (USA)

Terms of Reference: Produce a technical report for the calibration of array spectroradiometers primarily for the determination of colorimetric and photometric quantities, including sources of error in array spectral measurements systems, evaluation of these errors, calibration methods and methods for the determination of uncertainty.

TC2-52 Addendum to CIE 121 for the Photometry of Emergency Lighting Luminaires

Chair: G. Vandermeersch (Belgium)

Terms of Reference: To produce an addendum to CIE publication 121 containing specific requirements for the photometry of emergency lighting luminaires, in particular to provide additional correction factors on the relative output of the luminaires at specified times of operation.

Status: The TCC will start the final official enquiry within TC2-52 on the photometry of emergency lighting at the end of June, after the London IEC 34 meetings. The concepts he promoted regarding emergency ballast lumen factor are in a voting stage in IEC and as soon as approved, CIE can definitively publish the TC document. As he explained several times, IEC has the mandate to

decide what to measure (the safety concept EBLF) and CIE should provide recommendations on how to make the measurements. As he was working in both bodies he could coordinate the two approaches.

TC2-53 Multi-Geometry Color Measurements of Effect Materials

Chair: G. Roesler (Germany)

Terms of Reference: Write recommendations for the color measurement of effect materials.

Workplan:

Comparison of the DIN and ASTM standards on Multigeometry color measurement.

Preparation of an educational section to combine most interests.

Recommendations from the educational section for the next meeting.

TC 2-56 (S) CIE/ISO standard on retroreflection measurements

Chair: C. Miller (USA)

Terms of Reference: To prepare a CIE/ISO standard on the measurement of retroreflective materials based on CIE Publication 54.2

Status: The TC was established in 2003, and had its first meeting in May 2004 at NIST (in conjunction with CORM and ASTM E12 meetings), and the second meeting on June 9, 2004 in Tokyo. The outline of the document was discussed and agreed at these meetings. Fundamental terms were also discussed. Calibration techniques to be included are the relative method, absolute method, and substitution method. The TC discussed the requirements for the ISO standard.

TC2-57 (S) Revision of CIE S014-2

Chair: A. Robertson (Canada)

Terms of Reference: To revise CIE Standard S014-2 (Colorimetry Part 2: CIE Standard Illuminants) to include Illuminant D50

Status: DS014-2 *Colorimetry - Part 2: CIE Standard Illuminants* is being revised to change the wavelength definition.

CIE Draft standard DSO14-2.2/E: 2004, Colorimetry Part 2:CIE Standard Illuminants has been sent to CIE National Commitees for comment and sales to interested parties.

TC2-58 Measurement of LED radiance and luminance

Chair: K. Kohmoto (Japan)

Terms of Reference: To prepare a CIE Technical Report setting out recommended measurement methods for the luminance and radiance of LEDs, taking particular account of the specific requirements of relevant photobiological safety standards

Status: The TC was established in 2003. The TC had its first meeting on June 10, 2004 with 38 participants. It was agreed that the TC would look only at single LEDs to begin with, and that both lensed and bare chip LEDs would be included. The TCC requested members to send comments and suggestions as soon as possible, so that a first draft can be prepared for the next D2 meeting. A contents list will be prepared within 6 months.

Reporters

R2-21 Use of detectors as absolute transfer standards for spectroradiometry

Reporter: N. Fox (UK)

Terms of Reference: To review the potential use of absolutely calibrated spectroradiometers as transfer standards

R2-23 ISO/CIE Standards for the measurement of reflectance and Transmittance

Reporter: D. Rich (USA)

Terms of Reference: To investigate the need for converting the CIE technical report on reflectance and transmittance measurement (CIE 130) to a joint ISO/CIE standard

R2-27 Field Measurement for Traffic Signals

Reporter: C. Andersen (USA)

Terms of Reference: To assess the need for a TC to produce recommendations on field measurements for traffic signals, in particular those using LED arrays.

R2-28 Evaluation of Colorimeter Spectral Responsivity

Reporter: B. Kranicz (Hungary)

Terms of Reference: To review new methods for assessing the 'quality-of-fit' of the spectral responsivity of colorimeters, particularly for use with new sources such as LEDs.

R2-29 Characterization of Imaging Luminance Measurement Devices

Reporter: P. Blattner (Switzerland)

Terms of Reference: To prepare a proposal for a new TC to prepare recommendations on the characterization and calibration of CCD-based imaging photometers, having input from D4 and D8 on the needs from the application side.

Status: The conclusions of the reporter were:

- from a metrological point of view, Imaging Luminance Measurement Devices (ILMDs) are complex systems (traceability, software validation, etc),

- the parameters defined by CIE 69-1987 are not sufficient to characterize ILMDs,
- there is interest from industry to have some guidelines on how characterize ILMDs

The reporter proposed a need for a new TC. Proposed TR: Prepare a Technical Report on methods for the characterization of imaging luminance measurement devices. Blattner agreed to chair this new TC.

R2-31 Problems with the Spectroradiometric Measurement of Light Sources
Reporter: D. Gibbs (UK)

Terms of Reference: To consider the need for a revision of CIE 63 (1984) and make a recommendation regarding whether a separate document is necessary to deal specifically with issues relating to band pass and sampling intervals, including the effects on color calculations.

Status: Gibbs proposed a new TC as below and volunteer to chair the new TC. Proposed Title: Effect of instrumental bandpass function and measurement interval on spectral quantities. Proposed TR: To produce a technical report that describes the effect of instrumental bandpass functions and measurement wavelength interval on spectrally resolved quantities, and provide recommendations on suitable methods to minimise the error introduced by instrumental bandpass functions on spectrally integrated or weighted quantities. It was suggested that the TC should also include recommendations on how to report data e.g. how should bandwidth and step interval be indicated in the data file.

R2-32 Visual Appearance Measurement
Reporter: M. Pointer (UK)

Terms of Reference: To monitor the work of Divison 1 on visual appearance measurement, which will include potential new measurement areas

Status: The work in D1 is in TC 1-65 Visual appearance measurement. A possible aim of "appearance" measurement is the development of a software tool that allows an evaluation of the visual perception of a product based on physical measurements. Ultimately this could lead to development of an instrument that can perform the tasks of a human observer in real-time for a wide range of types of products and complex surfaces, evaluating colour, gloss, pattern, surface texture, etc. A copy of a National Physical Laboratory Technical Report (Measuring Visual Appearance – A Framework for the Future) has been circulated to TC members for comment. The intention is that this report be published as a CIE Technical Report after a CIE NC ballot.

R2-33 Measurement of Laser-Based Projection Displays
Reporter: K. Niall (Canada)

Terms of Reference: To describe concepts and methods of photometry for the comparison of laser-based projection displays.

R2-34 Methods for Characterising and Calibrating Detectors in Photon Counting Regime
Reporter: M. L. Rastello (Italy)

Terms of Reference: To consider the emerging requirements for characterisation and calibration of detectors in the photon counting regime.

New Technical Committees

TC2-59 Characterization of imaging luminance measurement devices
Chair: P. Blattner (Switzerland)

Terms of Reference: To prepare a Technical Report on methods for the characterization of imaging luminance measurement devices.

This TC was proposed as a result of R2-29.

TC2-60 Effect of instrumental bandpass function and measurement interval on spectral quantities
Chair: D. Gibbs (UK) AD: Sauter

Terms of Reference: To prepare a technical report that describes the effect of instrumental bandpass functions and measurement wavelength interval on spectrally resolved quantities and provide recommendations on suitable methods to minimise the error introduced by instrumental bandpass functions on spectrally integrated or weighted quantities.

This TC was proposed as a result of R2-31.

New Reporterships

R2-35 Uncertainties in Distribution Temperature Determination
Reporter: Alan Robertson

Terms of Reference: To investigate the potential effect of a change to the definition of distribution temperature to include a statement regarding weighting the spectral distribution values by the uncertainty of the measurements at each wavelength.

This TC was proposed following the discussion of TC2-43 earlier in the meeting (see TC2-43 report above). D2 agreed to establish this reportership with no objection.

R2-32 Visual Appearance Measurement
Reporter: Mike Pointer GB

Approved

Terms of Reference To monitor the work of Division 1 on visual appearance measurement which will include potential new measurement areas.

The work in Division 1 is in TC 1-65 Visual appearance measurement.

Introduction

A possible aim of “appearance” measurement is the development of a software tool that allows an evaluation of the visual perception of a product based on physical measurements. Ultimately this could lead to development of an instrument that can perform the tasks of a human observer in real-time for a wide range of types of products and complex surfaces, evaluating colour, gloss, pattern, surface texture, etc.

TC 1-65 will seek to establish the basic elements of a framework to aid the development of a suitable measurement regime. It will require a review of existing techniques and their suitability to isolate the requirements for the development of mathematical and software tools to identify a key minimum set of measurands required, coupled with (and based on) real-time measurement of physical characteristics and visual assessments.

Suggested Work Programme

1. To produce a technical report describing a suitable framework for the measurement of visual appearance.
2. To consider the establishment of separate Technical Committees to work on specific aspects of visual appearance measurement, e.g. gloss, translucency.
3. The whole question of terminology needs to be addressed – the present International Lighting Vocabulary does not include many terms associated with appearance. We need to work with ASTM (ASTM Method E284 *Standard Terminology of Appearance*) to achieve harmony with CIE and get the necessary terms into future editions of the ILV.
4. To produce a list of available instruments that could support the various elements of the framework.
5. To produce a list of academic, and other research institutions that are working on aspects of the framework.
6. To consider the publication of case studies that show individual applications of appearance measurement.
7. To encourage participation from industry in the work of refining the framework and building measurement procedures that relate to appearance.

Report

A copy of a National Physical Laboratory Technical Report (Measuring Visual Appearance – A Framework for the Future) has been circulated to TC members for comment. The intention is that this report be published as a CIE Technical Report after a CIE NC ballot in late 2004.

CIE PUBLICATIONS

Guide on The Maintenance of Indoor Electric Lighting Systems

CIE x97:2005 (2nd edition)

During the life of a lighting installation, the light available for the task progressively decreases due to accumulation of dirt on surface and aging of equipment. The rate of reduction is influenced by the equipment choice and the environmental and operating conditions. In lighting scheme design we must take account of this fall by the use of a maintenance factor and plan suitable maintenance schedules to limit the decay. Lighting standard "ISO 8995/CIE S 008-2001 Lighting of Indoor Workplaces" in Section 4.8, recommends a minimum maintenance factor. It states that "The lighting scheme should be designed with overall maintenance factor calculated for the selected lighting equipment, space environment and specified maintanance schedule". A high maintenance factor together with an effective maintenance programme promotes energy efficient design schemes and limits the installed lighting power requirements.

This revision of the guide describes the parameters influencing the deprciation process and develops the procedure for estimating the maintenance factor for indoor electric lighting systems. It provides information on the selection of equipment and the estimation of economic maintenance cycles and gives advice on servicing techniques. It show some examples of data but for accurate data it recommends that data should be obtained from the manufacturers.

This guide replaces CIE 97-1992 "Maintenance of indoor electric lighting systems". It is written in English, with a short summary in French and German, consists of 34 pages with 13 figures and 6 tables, and is readily available via the website of the Central Bureau of the CIE.

www.cie.co.at

Vision and Lighting in Mesopic Conditions

Proceedings of the CIE Symposium 05
CIE : 028:2005

This CIE Symposium was held in the Auditorio Municipal of León, Spain on 21 May 2005, as a satellite meeting of the CIE Midterm Meeting and the International Lighting Congress “Lighting in the XXI Century”. The present volume contains the text of the 13 papers read at the meeting.

The first paper by Prof. Halonen summarizes the findings of a European consortium that had as its task to develop a model based on different task performance experiments. Details of these experiments are contained in three subsequent papers.

Dr. Sagawa's paper showed progress in the other area of mesopic photometry based on brightness matching, and presents the outlines of a supplementary system of photometry.

Professor Berman's paper discusses some fundamental problems mesopic lighting and vision research is faced with, due to the non-linearity and non-additivity of visual perception in the mesopic range.

A further group of papers led by the invited paper by Professor Rea discusses the US version of a task performance based mesopic photometry. Several other papers discuss application items based on one or the other new mesopic model.

CIE is progressing to define a task performance based photometric system, and anybody who is interested in the fundamental visual mechanism of mesopic vision, or would like to know in which direction the street lighting most probably will move, and which measuring instruments will be needed to evaluate mesopic lighting systems, should read the papers presented at this meeting.

The proceedings is written in English, with a short summary in French and German, consists of 70 pages with 31 figures and 9 tables. A CD-ROM with all papers in a searchable form is included. CIE x028:2005 is readily available via the website of the Central Bureau of the CIE.

www.cie.co.at

Practical Design Guidelines for The Lighting of Sport Events for Colour Television and Filming
CIE 169:2005

This technical report gives practical guidance to those concerned with the designing and planning of sports facilities where lighting is required to meet the needs of colour television and filming.

The report should be read in conjunction with CIE 83-1989, which defines the quantitative lighting requirements. This report is arranged in three main sections:

Firstly, there is general guidance on sports lighting design including luminaires and lamp types, calculation methods, and electrical installation.

The second section lists 51 sports with specific advice on the lighting of each.

The third section gives references to relevant standards and in particular publications in which new sports lighting installations may be described.

The report is written in English, with a short summary in French and German. It consists of 79 pages with 90 figures and 1 table, and is readily available via the website of the Central Bureau of the CIE.

www.cie.co.at

Test Cases to Assess The Accuracy of Lighting Computer Programs
CIE 171:2006

The objective of this report is to help lighting program users and developers assess the accuracy of lighting computer programs and to identify their weaknesses. A validation approach is therefore presented based on the concept of separately testing the different aspects of light propagation. To apply this approach, a suite of test cases has been designed where each test case highlights a given aspect of the lighting simulation domain and is associated with the related reference data.

Two types of reference data are used: data based on analytical calculation and data based on experimental measurements. The first is associated with theoretical scenarios that avoid uncertainties in the reference values. The second type is obtained through experimental measurements, where the scenario and the protocol are defined in a manner that minimizes the uncertainties associated with the measurements.

A set of recommendations is also presented in order to achieve reliable experimental data for validation purposes. These recommendations address the choice and description of the scenarios, to the experimental protocol precautions, to the estimation of the error sources and to the presentation of the reference data.

The report is written in English, with a short summary in French and German. It consists of 97 pages with 27 figures and 65 tables, and is readily available via the website of the Central Bureau of the CIE.

www.cie.co.at

FORTHCOMING EVENTS

Light Fair 2006
May 28-30, 2006, Las Vegas USA

If learning more about lighting is on your "to do" list, then LightFair International 2006 offers a myriad of choices with 76 courses and more than 240 hours of programming.

Conference topics address everything from lighting software and applications, to business and lighting fundamentals, to design innovation and product updates, to project case studies.

Renowned lighting designers, educators, architects, engineers and consultants lead the courses.

Core curriculum provides AIA, ASID, IIDA, IESNA and IFMA accreditation (upon individual association approval) and Conference participants may choose from:

- 12 Daylighting Institute workshops;
- One two-day Daylighting Fundamentals course;
- Six two-day LightFair Institute immersion courses;

- Nineteen, three-hour workshops;
- Seven Masters courses; and,
- 30 Seminars.

Newly available in 2006 is Lighting Fundamentals in Spanish (Fundamentos de Iluminacion ED-100). Also, participants will be able to create highly individualized, personal two-day curricula by selecting from both the 12 Daylighting Institute Workshops and the 19 LightFair Institute Workshops.

All Daylighting Institute and LightFair Institute courses will take place Sunday, May 28 and Monday, May 29.

Masters courses will be held Tuesday, May 30 through Thursday, June 1.

All seminars will be held Tuesday, May 30 through Thursday, June 1, while the LightFair International trade show is underway.

For more information visit :
Light Fair International's website :
http://www.lightfair.com

6th International Lighting Conference
September 19 - 22, 2006 (Kaliningrad – Svetlogorsk, Russia

The Illuminating Engineering Society of Russia together with the All-Russian Lighting Research Institute (VNISI) and the Lighting Trade Association are organizing the 6th International Lighting Conference in Russia this September.

Conference Topics

- Energy saving problems in illuminating engineering
- Light and health
- Lighting devices
- Light sources and ballasts
- Exterior and interior lighting installations
- Light and architecture, lighting design
- Irradiating installations in industry, agriculture and medicine
- Computer methods in lighting
- Lighting measurements
- Ecology aspects of lighting problems
- Problems in lighting education

Leading Russian and foreign specialists in science, manufacturing, design and trade of lighting product will take part in the conference. You will find all the information about the conference here: http://www.lta.ru

Dead line for abstracts: April, 15, 2006 Conference languages: Russian, English.

For further information contact:
Leonid Prikupets,
Coordinator of the conference
Phone: (7-495) 687 63 11, Fax: (7-495) 687 62 90
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129626, Moscow, Russia

BOLcolor 2006
Bolivian Congress of Color
September 25-27, 2006, La Paz, Bolivia

This conference is organized by the Asociación Boliviana del Color, the Universidad Catolica Boliviana San Pablo and Monopol Ltda, and will cover colour study and research in all subjects. Languages: Spanish, French, English, German, Portuguese, Italian.

Please send your 1-page abstract by 31 May 2006 to:

PINTEC de Monopol, Casilla 10305
Calle 10 esq. Av. Los Sauces
Calacoto, La Paz, Bolivia
fax: +591 2 277-2516
e-mail: asociacionbolivianadelcolor@entelnet.bo
www.asociacionbolivianadelcolor.8m.com

AIDI International Conference 2006
Light and Architecture
October 9-10, 2006, Venice, Italy

This conference will be held during the 10th Biennial Architecture Exhibition under the patronage of the CIE National Committee of Italy and will deal with the following topics:

- Light and urban landscape
- Light, space language
- Light, environment, energy
- Light, shape, technology
- Light and shadows: art, scenography, emotions

Invitation to attend the conference by presenting a paper is extended to all lighting professionals, architects,engineers, planners, interior designers, industrial designers, public administrators, enterprises of the field, research centers, universities and to everyone with an interest in the specific items of the theme.

Authors are invited to submit an extended abstract (min.1000/max.1500 words) in Italian and/or in English to the AIDI Secretariat: segreteriadue@aidiluce.it.

For details on the Call for Papers please check the AIDI website.

Deadline for abstracts is 28 February 2006.

For further information, please contact:
AIDI Secretariat
Adelaide Prevosti
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TRILUX world-wide

As a Global Player with innovative lighting systems and components the TRILUX group ranks among the leading companies. Production sites in Europe and Asia, subsidiaries in Europe and sales branches in Germany with more than 3000 employees are the basis for the competitiveness of the TRILUX group. Sales partners in other countries of the world also offer comprehensive consultation and client-specific service in all luminaire-related questions

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The success of TRILUX is based upon solid foundations: quality has always been a major priority, as has fairness to our business partners, commercial reliability as well as technical accuracy and farsightedness as a result of a manufacturing competence matured over decades of experience. This is what determines the strategic orientation of the TRILUX group.

Optimising illumination for the people is undisputedly the centre of our entrepreneurial thinking as we consider the refinement of lighting provided by modern light sources in order to improve both living and working conditions as well as to influence people's health, well-being and mood in a positive way - this, as one of the most important missions innovative lighting systems have to accomplish, is our task. Our research and development activities are committed to the deployment and realisation of progressive lighting concepts supported by a variety of new approaches and attitudes.

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Website: www.bajajelectricals.com

CIE Expert Symposium on Visual Appearance

October 19-20, 2006, Paris, France

The CIE Expert Symposium on Visual appearance will span all aspects of visual appearance, including metrology, perception, and application. Emphasis will be placed on:

- Gloss, texture and translucency
- Appearance measurement
- Instruments and standards

Background

The visual appearance can be one of the most critical parameters affecting customer choice and itneeds, therefore, to be quantifiable to ensure uniformity and reproducibility. A starting point in assessing the appearance of a consumer product might be the measurement of its colour. The description of its total appearance, however, cannot be achieved by the definition of colour alone; other attributes of the object contribute to the overall appearance and these might include gloss, translucency and surface texture, as well as the environment in which the object is seen.

The aim of this symposium is to report and review the interactions between these various components that provide a framework to describe and measure visual appearance. The interactions between the various components are complex. Physical parameters are related to the objects in scenes and these in turn are influenced, at the perception stage, by the physiological response of the human visual system and, in addition by the psychological aspects of human learning, pattern, culture and tradition. By dealing with the optical properties of materials under the four headings of colour, gloss, translucency and texture it is possible for measurements to be made: It is recognised that these measures are not necessarily independent; colour may influence gloss, colour will certainly influence translucency, and texture is probably a function of all three of the other measures.

Who Should Attend

This meeting is open to everyone with an interest in the science of visual appearance, in visual aspects of appearance, as well as the development of novel measurements techniques and the applications to the real world in industry, architecture etc.

Call for Papers

The two-day Symposium will feature Invited Papers and Contributed Papers. Ample time will be allocated for round-table discussions. A Poster Session will also be included. Papers should deal with one of the following subjects:

- Gloss, texture, translucency
- Definition of appearance and appearance attributes
- Appearance measurement
- Instruments and standards

Authors are invited to submit 500 words extended abstract of their proposed contributions, in English, using the Submission Paper Form (download Word template). Extended abstracts should be sent by email or post to the Chair of the Technical Program of the Symposium no later than 15 May 2006 to Dr. Michael Pointer at: National Physical Laboratory Hampton Road, Teddington TW11 0LW, UK, E-mail: mike.pointer@npl.co.uk

Authors will be notified of acceptance of their abstract by 30 June 2006. Instructions for preparing camera-ready copy of papers (6-8 pages) will be forwarded to accepted authors. Final camera-ready copy is due at the Symposium. The proceedings of the Symposium will be made available after the meeting.

For further information contact

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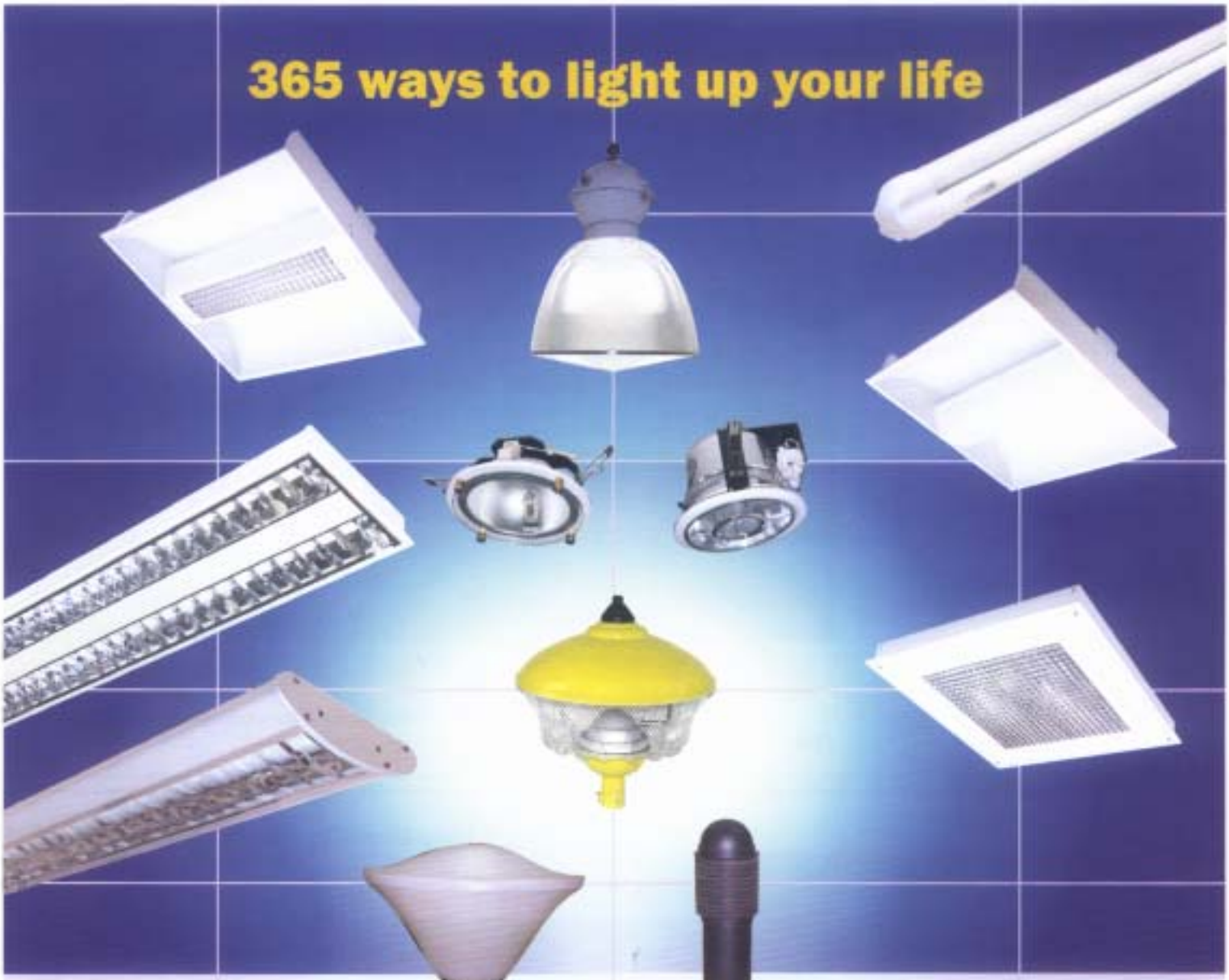

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Luminaire Design 2005

Ranjan Ghosh Dastidar

The world is converging, space is becoming precious. Appropriate lighting is the key to appearing larger and spacious. But lighting design and application cannot start working without the basic element – the Luminaire.

Luminaires give us sustainable, controllable and maintainable artificial light. This statement draws the outline of what customers expect in a luminaire. The light source is to be available for the specified period of time; it must offer control to direct the light to the desired area or the choice of dimming it when necessary. Maintainability does not need elaboration.

Before getting into the aspects of industrial design let us look into the design requirements of a luminaire. Any design is a good compromise of the diverging demands on the product designer. Let us examine the requirements:

Optical

The designer must know where and how much light the customer needs. While a home may require no ceiling lights but emphatic spots, an office may demand glare free holistic effect of uniform lighting conducive to working onscreen bringing in concepts of direct/indirect lighting through use of pedestal, pendants or wall washers.

Technical

Lamps and accessories may have specific technical requirements. For example, burning position of the lamp, operating temperature of the accessories, heat dissipated by the lamp, country or location specific supply situations may be quite demanding.

Invention

New inventions demand the designer's attention. Sometimes demand from the luminaire designer ends up in invention of a new lamp, sometimes a new lamp or accessory completely changes the way a designer conceives a luminaire.

Environment

Conditions of use may influence material, shape, construction, even the fasteners and of course the finish of the luminaire. Protruding hardware is not welcome in today's interior. Luminaire designers are using more springs, magnets, snap fit fixtures and the like.

Mechanical

It is desired that the designer have enough exposure to the latest manufacturing machines and processes so that the design can be cost effective. Site specific designs, shapes and colour combination impart character to the interior but generate short series. This necessitates use of CNC machines.

Installation

With labour costs going up easy and secure installation with less man power is important.

Maintenance

Should be minimum and easy.

Standards

A long series is the precondition for a smartly tooled product. Hence it is important for the product to be suitable for the world market. The designer should comply with home as well as international standards.

Safety

For any electrical product safety requirements are implied. There are countries where there are very stringent safety requirements over and above the standard requirements.

Complaint

It makes good business sense to scan through the complaint records of similar designs and take care of them while working on a new design. Complaints essentially reflect the unfulfilled desires of the customer. Hence keeping an eye on the nature of the complaints gives a futuristic touch to the upcoming the design.

Styling

Industrial design integrates the above mentioned divergent demands with demands of manufacturability and contemporary styling while keeping an eye on the cost of the design. To make the maximum out of the light, it is recommended by the architects and interior designers to have white or near white colour for the ceiling and the floor. Luminaires used in the ceiling mostly have white or near white finish to blend well. A trend is being noticed to have matt stainless finish to sprinkle richness to the interior. Thus colour plays an important role in providing balance and completeness to the design. It is this completeness that enhances market acceptance.

Packaging

Presentation of the product in today's competitive market is extremely important. Due consideration of shape, size, quantity, mode of delivery and packaging material at the product design stage may substantially reduce the ultimate packaging cost. While designing packaging for a luminaire, the designer is to be extremely conscious about the biodegradability of the packaging material. Excessive

use of thermocol (expanded polystyrene) is bound to draw attention of the environmentalists in the near future. Designers of tomorrow better take note and act before being forced to act in haste because of regulations. Though mentioned as the last point, this definitely should not be taken as the last step of luminaire design.

Market Input

The designer must take into account any special market input regarding range, quantity, mode of delivery or time unless it is a customer specific product; where such inputs come naturally. Short series may seriously influence choice of material, shape, process of manufacturing or packaging.

Cost

No design is complete without cost parameters frozen. This includes estimation of running and maintenance cost with cost of manufacturing.

Investment

For a short series, initial investment may become a serious consideration and influence selection of shape, styling, finish or process.

Time

Time available to launch the product may influence any or all the design considerations discussed above.

Now, what makes a luminaire?

Besides the hard components, certain soft qualities are sought in a luminaire. They are **Right light on the Right spot at the Right time at the Right cost.**

By RIGHT LIGHT we mean the right quantity and quality of light. With different age groups and different situations we need different levels of light. This helps in selection of the source and the optics.

RIGHT SPOT means where light is desired and implies where it is not required. That directs the selection of control. Optical control for light, electrical control in the form of switches, dimming devices meet the need of light at the RIGHT TIME.

RIGHT COST has various facets. It encompasses cost of easy installation, running cost, and cost of easy and minimum maintenance**.** Running cost comprises cost of consumables (lamps, starters and accessories) and cost of energy. Energy consumed is the sum total of energy consumed by the lamp and the circuit loss. Ballast loss is the main component of circuit loss. It is important to have a ballast with low watt loss.

The hard components:

We need SOURCE / S. We need ACCESSORIES to make them work, we need to CONNECT the source to the accessories, we need CONTROLS and we need a CONTAINER to encase them for physical protection while in use. Let us discuss each one and develop a luminaire.

To design a luminaire we need to know what light source will be used in it. Luminaire design starts with selection of the lamp(s). The twenty first century luminaire designer is spoilt with choice of light sources right from the age old GLS lamp to the ultra modern LED. And this abundance of choice is greatly influencing the construction, sleekness, choice of material, process—in a word every variable that goes in luminaire design and manufacture.

If accessories are not included in the luminaire it is referred to as a lantern. There may be situations like availability of very low ceiling space that may demand that the accessories be separately located. Such a trend of using lanterns with separate accessories boxes is quite common now.

Lamps definitely require holding. The holder should be firm enough not to end in a loose connection due to vibration while in use. That is why lamp holders with spring locks should be used for heavy protruding or hanging lamps. An apt example is the long single ended compact fluorescent lamps. Loose connection can play havoc if used with electronic accessories. Four pin lamp holders are strongly recommended with electronic accessories. A firm, definite lamp position is extremely important for precise optical control. Lamp holders must have sound terminals. This ensures electrical safety. The situation may demand spring locks here too. In certain cases we need to have a lamp support or clamp to hold a long lamp from drooping. This is important not only from aesthetic point of view, but also from the point of optical control.

Slim and light weight is the key word for any modern gadget. Unless electrical and thermal performance parameters of the lamps and the accessories are given due consideration, the designer may invite a lot of trouble for himself. This data is important for freezing the volume of an enclosed luminaire.

For connection we need wires. The conductor material is copper nickel plated. Insulation material may be rubber or PVC. Normal PVC insulation can take up to 90^0C, special formulations up to 115^0C. This is directly related to the air temperature inside the luminaire not only during normal condition but also in faulty conditions. Care should be taken to ensure that the wire does not come in contact with the hot components inside the housing. Other insulation provisions are Silicone rubber 200^0C and

Teflon 250^{0}C. But poor abrasion resistance property of Teflon has to be kept in mind. To have the best of both, Teflon wires with glass fiber sleeving is sometimes used. High voltage insulation is required when high surges are sent for ignition of the lamp. Wires may be single core or stranded. Single core wires are stiff. This offers firm connection with easy insertion, easy dressing with fewer clips and does not require end preparation. Stranded wires score a distinct advantage with flexibility. This is required for luminaires with turning heads. Stranded wires have the ability to retain firm connection while under vibration. They need end preparation. Selection of the correct cross section of the wire is important. Unless restricted by the standard IEC 598, this should be guided by the maximum current drawn; 0.5mm2 is the minimum prescribed with exceptions allowed at 0.4mm2. Even that does not allow use of 0.6mm diameter wire as is often found being used in many domestic luminaires. Designing for cost effectiveness does not mean compromising quality and safety parameters. Often lead in wires become an eyesore. The same can be avoided if suspension, mounting and termination are thought out in detail at the design stage.

For easy termination a connector block is provided. For certain site conditions, connectors with spring type terminations are used. To take the strain of self weight of the wire out of the terminal screws, it is advisable to use cable clamps.

We may have various controlling devices in a luminaire, namely optical control in the form of reflectors, refractors, diffusers, visors, filters and other time controllers like dimming devices and photo sensors.

The container holds all the above components in place and provides physical protection. Knowledge of various materials, manufacturing processes and the finishing processes used to make the containers is a prerequisite for a good understanding of industrial design.

Steel is the most widely used material for luminaires of Indoor use due to its cheap availability, mechanical strength, formability. Sheets of standard size are sheared to blanks. Alternatively, coils are used and slit to required size. Required holes are done in the flat stage before giving the desired shape using power presses. Depending on the series, tooling is done both for punching and forming. An advanced method is the use of precoated coils for roll forming for large series. For short series choice designs, where cost is no major consideration, CNC machines are used.

Steel components are easy to finish. Now precoated sheets are available with galvanised undercoats. If such sheets are used care should be taken in tooling and handling so as not to scratch the paint coating. Prevailing finish methods are wet painting, powder coating, or galvanising. Vitreous enameling is also an option. This is done for products to be used in aggressive environment. Each has its specific process, cost, design considerations.

Stainless steel is not very popular as a housing material. It is costly. For environmental considerations, it is used in components. Now the emerging trend is to use stainless steel in office interiors. Some designers prefer use of stainless steel luminaires or similar shade.

Aluminium is the next most widely used material. Floodlights and street lights demand structural rigidity and strength together with positive sealing against ingress of dust and moisture. As discharge lamps are used in such applications, the housing has to withstand higher temperatures. Aluminium offers great solutions. It is used as sheet, as cast, as extrusion. Depending on the end use, various alloys and grades are used. The most widely used alloy is LM6 as it offers required strength with the most needed flow characteristics. Standard sheet forming techniques are used to form reflectors. Blanks from standard sheet are pressed or drawn. Deep drawing calls for quite complicated and expensive tools. Depending on the finish requirement and investment, the casting process is either sand, gravity or pressure. Pressure die casting offers better finish, thinner sections but demands very high investment and a long series to justify the investment.

Finish is mainly anodising for reflectors. It is essentially a process of oxidation of aluminium into fine grains. Oxydised aluminium is inert. It can generate excellent specular or matt reflecting surfaces. Cast products do not require any finish excepting for use in very aggressive conditions. But aesthetic painting has become the norm of the day. City architects and designers at times prefer to leave their signature in special colour schemes used for the designs they select for their projects.

Plastic materials are used to make opal diffusers, prismatic controllers and protective enclosures. In our country fiber glass enclosures have not picked up. Cost, policy matters and abuse of the freedom that this designer material offered were the main reasons. But many components are being made with very many different grades of plastics. Acrylic, polycarbonate, nylon, ABS, urea formaldehyde, phenol formaldehyde, polystyrene, polypropylene are to name a common few. Before using them serious consideration is to be given to UV brittleness and degeneration with aging. Plastic technology is progressing rapidly. Thermo plastics can be thermoformed, rotomoulded, injection moulded or extruded while for thermosetting plastics compression moulding is the most widely used process.

Glass is also widely used as front shield. Developments in plastics replaced glass. Reasons were light weight and plastics were not as fragile as glass. Now wherever glass

is preferred to plastic, the reason is temperature and aesthetics. UV resistance is also a distinct advantage in favour of glass. Optical prisms, plane covers, colour filters and decorative opal ply covers are usual components. Sodalime (250^0C) and Borosilicate are the two usual varieties. Borosilicate glass is used for high temperature resistance. Prisms are hot moulded. Plane glass covers are toughened to enhance thermal shock resistance. Toughened glass provides necessary safety to the end user. Toughening is done by heating the glass around 600^0C and then suddenly cooling it with air jet. Toughened glass breaks into small pieces, hence is safe. Opal glass is extremely fragile. So it is coated with clear glass. Hence the term ply opal. Coloured opal ply glass is extensively used for decorative tops for home lighting.

Ceramic is used in components. In our country sophisticated home lighting housings are not made of ceramic. Cost is the main consideration. Iron inclusions impair insulation characteristics, hence are best avoided. Usual components are lamp holders and connectors.

With heavy demand of higher IP luminaires, knowledge of gasket material is a must. Natural (80^0C) is the lowest grade and cheap. Temperature resistance wise next come EPR (120^0C) and silicone (200^0C). Felt is a cheap and effective alternative. Rubber gaskets are moulded. Felt is used in strips.

With that design concepts and essential knowledge requirements for good industrial luminaires has been covered. No design is acceptable to the industry unless it complies with necessary requirements of ruling standards or certifying authority. The only important knowledge component that is left for coverage in detail is the verification and testing.

Ranjan Ghosh Dastidar
GM Innovation & Quality
Thorn Lighting India Pvt. Ltd.

School Lighting – An Efficient Way to Improve Our Children's Education and Wellbeing

Henri Juslén

An interesting study has been carried out in the USA into the relationship between lighting and performance in schools (Heschong *et al*, 2002). Researchers compared the results in classrooms with and without daylight and found that children learned significantly more when there was daylight in the room. The study concluded that this may have been due to better vision as a result of one or more of the following factors:

- higher illumination levels
- better colour rendering
- improved spectral content of daylight
- improved three-dimensional modelling with highlights and shadows
- reduction of flicker from electric lighting
- improved student and/or teacher morale or performance due to:
- mental stimulation from varying lighting conditions
- the calming effect of contact with the natural world (weather, time of day)
- greater mental alertness due to circadian biochemical response to daylight (neurotransmitter levels).

Although this study focused on daylight, most of these factors also apply to artificial lighting as well. Good lighting design can improve our vision, alertness and mood and prevent problems such as glare and flicker.

To see or not to see?

The most obvious purpose of light is to enable us to see. In theory, the more light you have, the better you see, the faster you can read, etc. – as long as there is no glare. Present norms (EN 12464-1 – *Lighting for indoor workplaces*) prescribe minimum maintained levels for schools. These are absolute minimum levels, and higher illuminances are always recommended. The purpose of the norms is to ensure that the basic minimum visual requirements are met. It is important to note that if classrooms are used for a number of different purposes, e.g. for school activities for children during the daytime and for evening classes for mature pupils at night, the lighting needs to be designed for the 'worst-case' scenario. In order to optimise visual performance in classrooms we have to illuminate those areas that need to be seen, such as the desktops and the blackboard. The (vertical) illuminance (or luminance) determines how well we can see people's faces and expressions. It is also very important to make sure that the vertical illuminance is high enough in the area where the teacher will be standing.

Sleeping or learning?

Circadian rhythms are changing patterns that cover a period of approximately 24 hours. These rhythms relate to body temperature, alertness and the secretion of hormones like melatonin and cortisol. Our biological clock is located in the suprachiasmatic nucleus and is synchronised by ocular light (Brainard and Bernecker, 1995).

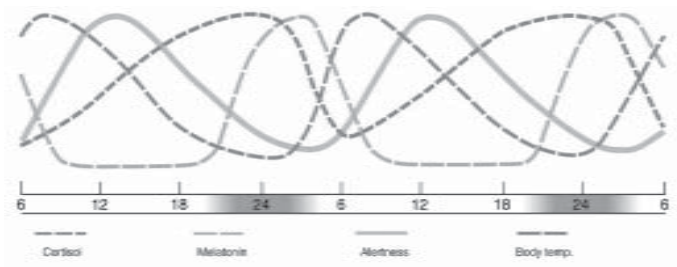

Figure 1. Double plot (2 x 24 hrs) of a typical circadian rhythms including alertness for a natural 24 hrs light-dark cycle

We are less alert in the morning and early afternoon. Research has shown that subjective alertness and speed

scores for visual search tasks are lower in the early morning. Since exposure to light in the morning affects the cortisol level in the body, and higher lighting levels also affect the electroencephalogram (EEG), making people more alert, exposure to higher levels in the morning is one way to prevent sleepiness and to improve learning. Pupils who learn in the daytime therefore benefit from increased lighting levels, particularly in the morning and during the 'post-lunch dip' (van den Beld, 2002).

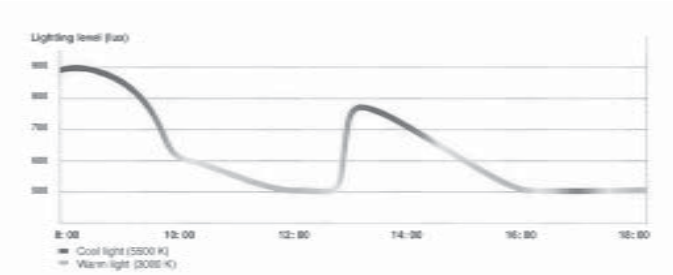

Figure 2. Conceptual lighting algorithm of activity during day time

Impact on well-being

With lighting, there is often a right and a wrong way to do things. A typical example, though not related to visual performance, is the flicker from magnetic ballasts, which can cause headaches and eyestrain, for instance (Wilkins *et al*, 1989). These problems disappear when the magnetic ballasts are replaced by electronic ballasts, which are also more energy-efficient.

In recent years we have gained a much better understanding of how lighting affects people. One example is the relatively alarming information about the connection between poor lighting and the development of myopia. Wolbarsht (2002) summarizes: "Higher lighting levels of ambient illumination produce smaller pupils with increased depth of focus and mean less accommodation is required for near objects. Thus, illumination levels that are sufficient to produce a small pupil when a person is reading or watching television – 2-3 mm or less – could be expected to prevent myopia from developing. In any event, children should be discouraged from using task lighting instead of ambient lighting. Classrooms should therefore be brightly lit, children should watch TV with the main room light on and should not do their homework using task lighting alone."

Should school be a nice place?

Boyden (1971) distinguishes between 'survival needs' and 'well-being needs' in humans. Most of our survival needs are fulfilled in a working environment, but failure to satisfy well-being needs can cause psychosocial maladjustment and stress-related illnesses. People – including children – need: "A visual environment that is interesting, that has aesthetic integrity and in which a certain amount of change meaningful to the observer is taking place". There is a direct link between this need and lighting. Ultimately, it is the lighting that determines the visual appearance of the space in which we find ourselves. And put quite simply, we feel better if we are in a nice environment. Important performance-related benefits of a positive mood include a willingness to help others, better memory, more efficient decision making, increased innovation and creative problem-solving ability (Isen and Baron, 1991). All of these are very important issues in schools. The environment in a school is therefore crucial, and lighting has an essential role to play.

Key steps towards better school lighting include ensuring that the lighting exceeds the recommended minimum levels, that only electronic gear is used, and that high levels of installed lighting are applied in conjunction with lighting controls to deliver the right amount of light in the right place at the right time.

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Henri Juslén
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Solid State Lighting – The rediscovery of light.

Luc van der Poel

There has been great excitement across the world in the lighting industry since the arrival of a new light source, Solid State Lighting or LED's. Although there is still some scepticism, most specialists agree that LED's are going to have a revolutionary effect

on the lighting industry and on lighting in particular. We have not seen anything like this since the discovery of electric light 126 years ago.

LED technology opens up possibilities of which architects and lighting designers have until now only been able to dream. Entirely new applications and designs have become possible. New dimensions are literally opening up or, in an artist's words we could say we have not just gained one new colour of paint – we have gained a whole new palette.

So what is it that is so special about LEDs?

Specific features

LEDs are more energy-saving than many of the existing light sources, especially if you also take into account their optical efficiency.

LEDs have an extremely long lifetime. For example, Luxeon LEDs have a lifetime of 50,000 hours at 70% of the initial light output. This, combined with the small dimensions of the LEDs, opens up completely new design possibilities in which the LEDs can be fully integrated into both the architecture of buildings and into new product designs. A good example of this can be found in the automobile industry, where the use of coloured LEDs is already widely accepted in indicator lights. In their 'concept cars', the car manufacturers are using entirely new designs that incorporate white LEDs as a replacement for the old headlamps.

Furthermore, LEDs have the advantage that they are based on a low-voltage technology, which not only makes installation easier, but also makes them safer.

LEDs are also still continuing to develop. At the moment, the level of efficiency is more of less doubling every two years.

Architecture

For the lighting designer, however, it is above all the saturated colours combined with the simple dimming possibilities that are so appealing. This, combined with easy control systems, enables them to create dynamic lighting levels and colours easily and in one and the same installation. Until now that has only been possible using mechanically operated colour filters, which also meant that a lot of the original white light was lost.

Now, however, by combining red, green and blue LEDs in one system, it is possible to use different dimming levels to create all the colours of the rainbow without any loss of light.

It is also possible to make white light change dynamically, from cool to warm, independent from the lighting level, and to vary the nature of the light from diffuse to a more focused light.

The basis

The basic technology on which LEDs are based originated from the semiconductor industry. This is part of the reason why the more traditional lighting industry is a bit wary of this newcomer.

The semiconductor industry has already produced revolutionary new products – mainly through miniaturisation – that have had a huge impact on our daily lives. Consider, for example, consumer products like the CD and DVD, computers and mobile phones, but also many products for more professional applications, such as portable medical equipment. Now it is lighting's turn.

Application

Since the introduction of electric light in the form of the well-known incandescent lamp, the lighting industry has worked on product improvement, above all on improving lifetime, efficiency and colour rendering. Since there is not one perfect light source, a number of specific lamps have become important in the lighting market. These lamps not only replaced already existing lamps, but in each case were also suitable for new applications, which is how the lighting market has continued to grow.

LEDs are no different. The fact that they can work with different colours, they put an end to the need for lamp replacement (maintenance) and are based on low-voltage technology, has meant that LEDs are now already widely used in marking and warning applications both for indoor and outdoor use.

Because the market acceptance of LEDs is also very much driven by economic factors, they will initially be used primarily in applications for which existing technology cannot offer a solution. However, with the prospect of lower product costs and a higher level of efficiency (lm/W), LEDs will start to be used in conventional applications as well in the future.

Changing industrial paradigm

These new possibilities will bring about a change in thinking within the industry. Until now, the lighting market has been geared mainly to lamp replacement, whereby lamps that no longer worked were replaced by new ones. It is now expected that the lighting market will place much greater emphasis on the emotional aspects of light and the way it is experienced, whilst the economic and rational aspects will simply be taken as given.

The main emphasis is on people and their needs. Lighting has to be easy to use and must fit in with the surroundings. Consider, for example, a restaurant where the lighting is adjusted to create the desired ambiance for breakfast, lunch and dinner. And don't forget your own living room at home, where the activities vary from cleaning and working to receiving

visitors and watching television. All of these different activities do actually require different lighting.

In addition, lighting will play a more active role in people's well being. A good example of this is the use of dynamic light effects in scanner departments in hospitals, where lighting is used specifically to make patients feel at ease.

It is up to the lighting industry to take up this new challenge and to devise solutions that can form an integral part of the physical environment and enable the user to adjust the light easily to suit his or her relevant needs.

Lighting expertise

A new technology always brings new players onto the market. From the point of view of application, however, the requirements for use are not so much going to change as increase. For this, extensive expertise in the field of lighting application is going to be essential. Any new player will, on the whole, have less knowledge of what is required to create good lighting. This is the job of application specialists, consultants and lighting architects. Their task is two-fold – to use the existing lighting technology to meet today's requirements and to develop the technology for tomorrow, making full use of LEDs. LEDs are going to lead us to rediscover light.

Luc van der Poel
Senior application specialist / designer
Solid State Lighting
Philips Lighting

WEBWATCH

Site Offers Research Summaries for Designers

InformeDesign is a website that takes a mountain's worth of research and turns it into manageable cyber-piles of digestible information.

InformeDesign's mission is to facilitate designers' use of current, research-based information as a decision-making tool in the design process, thereby integrating research and practice.

Established as a collaboration between the American Society of Interior Designers (ASID) and the University of Minnesota, the site updates its research summaries weekly. To date, there are 159 studies that feature, or mention, lighting.

You can search by keyword, or scan categories in three general areas:

Space - Issues - Occupants

In addition, Web casts with design leaders are archived and available for continuing education credits.

To learn more, visit the Informe Design site.

http://www.informedesign.umn.edu/

Impact of Dimming White LEDs:

In architectural lighting applications, dimming is an essential functional and aesthetic requirement of many types of spaces. The growing interest in white LEDs for general lighting has led to more flexible means of dimming control for these devices. However, maintaining a fairly constant white color while dimming LED systems is a challenge; in general, noticeable chromaticity shift during dimming is not desirable.

Two methods of dimming are available for mixed-color RGB (red, green & blue) and phosphor-converted high-power white LEDs: continuous current reduction and pulse-width-modulation (PWM). Continuous curent reduction involves a decrease in current supplied to the LED, which proportionally lowers the light output level. PWM involves rapid on-off cycling of the LED at a frequency high enough to eliminate any perception of flickering. However, little has been recorded showing the chromaticity shifts resulting from these methods. The objective of this study was to evaluate the chromaticity shift of high-power RGB and phosphor-converted white LEDs under these two dimming schemes.

Dyble, M., N. Narendran, A. Bierman, and T. Klein. 2005.

Chromaticity shifts due to different dimming methods. Fifth International Conference on Solid State Lighting, Proceedings of SPIE 5941: 291-299.

Links:
http://www.lrc.rpi.edu/programs/solidstate/completedProjects.asp?ID=76
http://www.lrc.rpi.edu/programs/solidstate/pdf/dyble-SPIE2005.pdf

Screwbase Compact Fluorescent Lamp Products

Abstract

This issue of Specifier Reports contains performance data for compact fluorescent lamps (CFLs) rated at or above 13 watts. The report includes NLPIP test data and manufacturers' data on both self-ballasted CFLs and modular CFL products that are sold with ballast and lamp packaged as a single unit. Introduced in 1979, CFLs replace incandescent lamps in a variety of luminaires with medium screwbase sockets. CFL products can reduce energy and maintenance costs compared to incandescent lamps. These lamps have a tube diameter of 5/8 inch (16 millimeters) or less and are available in various shapes. Some circular fluorescent lamps have larger diameters, but this report treats them as CFLs because they are compact in overall size and can be used as alternatives to incandescent lamps.

Date: 1999
Last updated: July 2005
Author(s): Mariana G. Figueiro
Number of Pages: 79

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PDF : http://www.lrc.rpi.edu/programs/NLPIP/PDF/VIEW/SR_SB_CFL.pdf

The potential of simplified concepts for daylight harvesting

Abstract:

Daylighting systems offer tremendous potential for reducing the energy consumption of electric lighting, but their usage has been inhibited by high costs and imperfect performance of current technologies. This paper presents predictions of energy savings for two proposed daylighting technologies, a daylight-sensing switch and an automatic blinds system, which employ simple, inexpensive components and designs. Assumptions of solar irradiance, blind position, blind operation behaviour, and light switching behaviour were combined with illuminance data and daylight factors to develop an algorithm for calculating the potential energy usages of six different systems in commercial private offices and open plan offices. Results show that the combined usage of the proposed technologies perform with an average annual energy saving of 24% compared with manual switching and blinds operation in Albany, New York. Compared with a photosensor-operated dimming system, the proposed technologies combined show better performance during summer months. Comparisons were also made for the systems in six US climatic regions.

Authors: R.P. Leslie1; R. Raghavan1; O. Howlett2; C. Eaton1
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Anool Mahidharia

OTHER NEWS

Technical Lecture on DALI

November 14, 2005, Kolkata

A Technical Lecture programme on "DALI - New Generation Dimming System in Lighting" was organized by the School of Illumination Science, Engineering & Design of Jadavpur University (SISED- JU) on 14th Nov. 2005 at the Dr. K. P. Basu Memorial Hall, Jadavpur University Campus.

The Speaker was Mr. C. R. Dutta, Business Excellence Manager at Philips Electronics India.

Sixty participants including ISLE Calcutta State Centre members, engineers from West Bengal Govt. PWD, Consultants, Electrical Contractors, other Professionals, Undergraduate and Post-graduate students of Illumination Engineering and Department of Architecture attended the programme.

In his presentation Mr. C.R. Dutta discussed the DALI protocol along with the other existing protocols in a very lucid manner. The unique feature of DALI was demonstrated by him with a programmable demo kit. The light sources used during the demonstration were tubular fluorescent lamps and dichroic halogen lamp.

This lecture and demonstration were interspersed with many interesting questions and followed by an interactive session.

The inaugural session was chaired by Prof. M. K. Mitra, Dean, Faculty of Engineering & Technology, Jadavpur University.

Prof. Somen Chakraborty, Director, SISED- JU welcomed the audience and briefly discussed the relevance of the day's topic in the purview of the Modern Intelligent Building system, where lighting plays a vital role as an integral part of it.

Prof. P. K. Bandyopadhyay, UGC Visiting Professor of Electrical Engineering Department, and Adviser, Design, SISED- JU narrated the role that SISED-JU should play to become the premier centre of lighting in India. In his

Messrs. P.K. Bandyopadhyay, M.K. Mitra, C.R. Datta and Somen Chakraborty

opinion, JU, with the existing Laboratory facilities in the Illumination Engineering Section and other infrastructural facilities being planned, could achieve this position within a short time, if it focussed on it and the distinguished members of the lighting community supported it.

Mr. C.R. Datta

In the Chairman's address, Prof. M.K. Mitra thankfully acknowledged the initiative taken by his colleagues - the faculty members of SISED-JU, for organizing such a programme as he felt that such technical talks, delivered by Industry Professionals, supplement the ongoing curricula and he marked such programmes as a part of the course. Although these lectures benefited all the invited guests interested in lighting, but he exhorted the students as well as faculty members of JU to take advantage of these lectures even more. He requested his colleagues to organize such programmes from time to time.

The programme ended with a vote of thanks given by Mrs. Kamalika Ghosh, Visiting Faculty, Illumination Engineering, E.E. Department, Jadavpur University.

LETTERS TO THE EDITOR

December 22, 2005

I received today, Hari ...

... my copy of the October issue of The Light Newsletter.

I am again upset about the fact that due to my lack of a visa, I missed a fantastic conference.

At the same time, life goes on and so will I.

The newsletter was great as always, and I am absolutely thrilled and amazed at just how far and fast the Indian Society of Lighting Engineers is proceeding and growing.

On January 8th, I will be attending the Centennial of the Illuminating Engineering Society of North America. It is my privilege to have served as chairman of the distinguished service committee, and I'm looking forward to attending the award ceremony...

Warm regards,
WMBROWN

MEMBERSHIP APPLICATIONS APPROVED BY GOVERNING BODY

New members admitted on 5th August 2005

M. No	Name & Addresses	Grade	Centre
I-0116	Skylite Enterprises Pvt. Ltd 14 Diamond Industrial Estate Vill: Valiv, Vasai East Dist: Thane 401 208	Institutional	Mumbai
IM-0116	Mr. Drumil J. Gandhi Skylite Enterprises Pvt. Ltd 14 Diamond Industrial Estate Vill: Valiv, Vasai East Dist: Thane 401 208	Member Institutional Representative	Mumbai
F(L)-0527	Mr. Sanjay L. Jadav GE India Industrial Pvt Ltd Plot No 42/1 & 45/14, Electronic City Ph II Bangalore 560 100	Fellow (Life)	Karnataka
F(L)-0529	Mr. Shyam Dutt Sharma Shri Hans Kirti EC -51, Phase 1 Chandan Van Mathura 281 002	Fellow (Life)	Delhi
M-1197	Mr. Pradeep Prabhakerrao Atnorkar 202 Harihareswar Appt. Katrap Road (above Sagar Hotel) Badlapur (East) Thane 421 503	Member	Mumbai
M-1198	Mr. Suresh Prasad Goswami C/5 BEST Officer's Quarters Altamount Road, Cumballa Hill Mumbai 400 026	Member	Mumbai
M-1199	Mr. Anand Baburao Kandage A/3 BEST Officers Quarter Prakash Kotnis Marg, Mahim Mumbai 400 016	Member	Mumbai
M-1200	Mr. Sadique Ali Abdullah BEST Officers Quarter Block A1, Flat 03 Morland Road Mumbai 400 008	Member	Mumbai
M-1201	Mr. Ganapati Dattatraya Patil Bldg- 9/302 , Fam C. H. S. Ltd Sector 11, Plot 19 & 19A, Koparkhairane, Navi Mumbai	Member	Mumbai
M-1202	Mr. Rajanish Umesh Kasar 239/6221, Anand Bhairavi Coop. Housing Society Pant Nagar, Ghatkopar (East) Mumbai 400 075	Member	Mumbai
M(L)-1204	Mr. Sushil Pandurang Rane D 2, 4/5/6 Phil Centre Thivim Industrial Estate Karaswada, Mapusa Goa 403 507	Member(Life)	Mumbai
M(L)-1205	Mr. Anjan Nath 21 New Santoshpur Road Flat No 7 Kolkata 700 075	Member(Life)	Calcutta
M(L)-1207	Mr. Divesh Mehta P-27, Sagar Manna Road Parnasree, Behala Kolkata 700 060	Member(Life)	Calcutta
M(L)-1208	Mr. Arvind Kumar Gupta P 27 Sagar Manna Road Kolkata 700 060	Member(Life)	Calcutta
M(L)-1209	Mr. Shivakumar Veeragowda No: 410, 80 Feet Road Girinagar, Second Phase Bangalore 560 085	Member(Life)	Karnataka

M(L)-1210	Mr. Umesh Balasubramanyam No 24, 5th Cross (Old) 14th Cross (New) Bhuvaneshwarinagar Bangalore 560 024	Member(Life)	Karnataka
M(L)-1211	Mr. Sista Venugopal Sarimanya 248 A, 3rd Floor, Shoba Niwas Rana Market, Munirka New Delhi 110 067	Member(Life)	Delhi
M(L)-1212	Mr. J. S. Yadav 112 -2 C I Silver Oak Apartments DLF Phase 1 Gurgaon	Member(Life)	Delhi
M(L)-1213	Mr. R. K. Gautam E 98 Sector 9 Vijay Nagar Ghaziabad	Member(Life)	Delhi
A-0851	Mr. Raghuveer Narayan Gaitonde Pranay Nagar, F-Wing Flat 702, Ram Mandir Road Extn., Vazira Naka, Borivali (W) Mumbai 400 091	Associate	Mumbai
A-0852	Mr. Anil Vishwanath Chaudhary A 302, White House S M Joshi Road (Opp: Samyadri Society) Kalwa (West), Thane 400 605	Associate	Mumbai
A-0853	Mr. Sanjiv Ramchandra Veer B/6 BEST Officers Quarter Altamount Road, Cumballa Hill Mumbai 400 026	Associate	Mumbai
A-0854	Mr. Brijesh R. Rawal Plot No 391 B, Amrit Bhavnagar 364001	Associate	Mumbai
A(L)-0855	Mr. Darshan Lal Bajaria C/O Garrison Engineer (AF) MES HQ Training Command Campus Hebbal, JC Raod Bangalore 560 006	Associate(Life)	Karnataka
A(L)-0856	Mr. Ramesh Dispal Sakaria Sakaria International 9 Shalimar Shopping Centre Lala Nigum Road, Colaba Mumbai 400 005	Associate(Life)	Mumbai
A-0857	Mr. Subhash N. Vasist No 8, P R Layout, 1st Main Seshadripurm Bangalore 560 020	Associate	Karnataka
A-0859	Ms. Annapurna Swamy 8 P R Layout, 1st Main Road Seshadripuram Bangalore 560 020	Associate	Karnataka
A-0860	Mr. Sumukh N. Vasist # 8, 1st Main Road P R Layout, Seshadripuram Bangalore 560 020	Associate	Karnataka
A(L)-0861	Mr. Suvarun Dalapati Flat- A, 4th Floor Purbasha Apartment 129/A. S. N. Roy Road Kolkata 700 038	Associate(Life)	Calcutta
A-0862	Ms. Rashima Jain HNO: 2373, Sector 16 Faridabad 121 002	Associate	Delhi
A(L)-0863	Mr. Amit Gehlot KARM, C 76 Shyam Marg, Shastri Nagar 302 016	Associate(Life)	Delhi
S-0185	Mr. Suddhasatwa Chakraborty 25A Raja Raj Ballav Street Kolkata 700 003	Student	Calcutta

Transfer of grade

M. No	Name & Addresses	Grade	Centre
F(L)-0524	Mr. Atul Gopinath Patil DCE's Establishment First Floor, Bijalee Bhavan Kussra Bunder Road, Mazgaon Mumbai 400 010	Fellow(Life) Transferred from M(L)-0309	Mumbai
F(L)-0525	Mr. Rajendra Kishanrao Bandal TUV Rheinland India Pvt Ltd 604 Kumar Pride Senet, S B Road Pune 411 016	Fellow(Life) Transferred from M-0627	Mumbai
F(L)-0526	Mr. Arun Kumar Vishwakarma 5/504 Eastend Apartment Mayur Vihar, Phase I (extn) Delhi 110 096	Fellow(Life) Transferred from M(L)-0147	Delhi
F-0528	Ms. Sudeshna Mukhopadhyay Philips India Ltd 7 Justice C M Road Kolkata 700 020	Fellow Transferred from M-0639	Calcutta
M(L)-1203	Mr. Nandish Vijaybhai Shah 11 Mahavir Society (near Mahalaxmi Cross Road) Paldi Ahmedabad 380 007	Member(Life) Transferred from A(L)-0612	Mumbai
M(L)-1206	Mr. Sunil Sadashiv Daddikar Daddikar Lighting Pvt Ltd 120 Yogi Ind Estate Rammandir Road, Goregaon (W) Mumbai 400 014	Member(Life) Transferred from A(L)-0150	Mumbai

New members admitted on 5th November 2005

M. No	Name & Addresses	Grade	Centre
I-0118	M/s Hueco Electronics (India) Pvt. Ltd Plot No 1, Survey No 297, 298, 299 Indo German Technology Park Urawade Taluka, Mulshi Pune 412 108	Institutional	Mumbai
IM-0118	Mr. Sachin Hukumchand Dobhada M/s Hueco Electronics (India) Pvt. Ltd Plot No 1, Survey No 297, 298, 299 Indo German Technology Park Urawade Taluka: Mulshi Pune 412 108	Member Institutional Representative	Mumbai
F-0532	Mr. G. P. Satsangi Bajaj Electricals Ltd Lum-BU 15/17 Sant Savta Marg Reay Road Mumbai 40 010	Fellow	Mumbai
F(L)-0533	Mr. K Jaisim 175/1 Pavillion Road, I Block East Jayanagar Bangalore 560 011	Fellow (Life)	Mumbai
F-0534	Mr. Hottengada Cariappa Thimmaiah 3265, 11th Main II Stage, Indira Nagar Bangalore 560 008	Fellow	Karnataka
F(L)-0535	Mr. H. R. Vaish Instapower Ltd S -19, Panchshila Park New Delhi 110 017	Fellow (Life)	Delhi
F-0536	Mr. Mohan Jeet Singh A-118 Swasthya Vihar Vikas Marg Delhi 110 092	Fellow	Delhi
F(L)-0537	Mr. Alok Kumar Basu Sarada Apartment Flat No B/4 214 Kasba Road Kolkata 700 042	Fellow (Life)	Calcutta

F(L)-0538	Ms Madhumita Sen 182 Garia Gardens, Garia Kolkata 700 084	Fellow (Life)	Calcutta
F(L)-0539	Mr. Amreshwar Pratap Singh Chief Engineer (Navy) Station Road Visakhapatnam 530 007	Fellow (Life)	Chennai
F-0540	Mr. Purushottam Devkinandan Chidgupkar MIT Women Engineering College Paud Road, Kothrud Pune 411 038	Fellow	Mumbai
F(L)-0541	Mr. B. R.V. Murthy 69 Vysya Bank Colony Sarakki Road Bangalore 560 078	Fellow	Karnataka
F(L)-0542	Mr. A. S. Chandel Principal CE(E) BSNL 8-5-363 C.A. Lane, Abids Hyderabad 500 001	Fellow (Life)	Chennai
M-1242	Mr. Ashok Kumar M 577 RBI Colony Mumbai Central Mumbai 400 006	Member	Mumbai
M-1243	Mr. Aslam Ismail Khan Yusuf Manjil (1st Floor) 27-28 3rd Peer Khan Street Mumbai 400 003	Member	Mumbai
M(L)-1244	Mr. R. N Meena 368/E Officers Colony Seshadri Road Bangalore 560 009	Member(Life)	Karnataka
M-1245	Mr. Jugta Singh A-3/60, Paschim Vihar New Delhi 110 063	Member	Delhi
M-1246	Mr. Urmil Sarin D 602 Kaveri Apt Alaknanda New Delhi 110 019	Member	Delhi
M(L)-1247	Mr. Bharat R. Soni 10A Navinchandra Park Civil Camp Road, Shahibaug Ahmedabad	Member(Life)	Mumbai
M(L)-1248	Mr. Alkendra Singh Kalyanwat 116 Prithvi Raj Nagar Maharani Farm, Durgapura Jaipur 18	Member (Life)	Delhi
M(L)-1249	Ms Bharati Chhabra C 136, Golf View Apts Saket New Delhi 110 062	Member (Life	Delhi
M(L)-1250	Mr. S. D Saini 65 Kewal Kunj Apts Sector 13, Rohini New Delhi 110 085	Member (Life)	Delhi
M(L)-1251	Mr. N. Muthumaran 1/4 Eswari Appts Appasamy Street Umapathy Street Ext West Mambalam Chennai 600 033	Member (Life)	Chennai
M(L)-1252	Ms Konika Das (Bhattacharyya) P-47 Shyacharan Smrititirtha Road New Alipore Kolkata 700 053	Member (Life)	Calcutta
M(L)-1253	Mr. Raj Kumar Agrawal Raj Agrawal & Associates 8B Royd Street, 2nd Floor Kolkata 700 016	Member (Life)	Calcutta
	Principal CE (E) BSNL, 5-8-363 C.A. Lanl, Abids Hyderabad 500 001		Hyderabad
M(L)-1254	Mr. Naba Kumar Bhattacharyya 70/1 Sisir Bagan Road Behala Kolkata 700 034	Member (Life)	Calcutta
M-1255	Ms Salini Garg MIT Women Engineering College MIT Campus, Ex-Serviceman Colony Paud Road, Kothrud Pune 411 038	Member	Mumbai
M-1256	Mr. K. V. Harsha Babu Harsha Design Associates A 1, 31st Cross, 3rd Main 7th Block, Jayanagar Bangalore	Member	Karnataka
M-1258	Mr. Vinod Kumar Sharma G-447 Sriniwaspuri New Delhi 110 065	Member	Delhi
A-0881	Ms Meenakshi Sethi 47 DDA Flats, Pkt- I, Sector 23 Phase I, Dwarka New Delhi 110 075	Associate	Delhi
A(L)-0882	Ms. Dimpi Thukral G 27D Kanchanjunga Apts Sector 53 Noida 201301	Associate (Life)	Delhi
A-0883	Mr. Ram Kumar Agrawal 17 FF Shakumbhari Complex Durgakund Road Varanasi	Associate	Delhi
A(L)-0884	Mr. Pradeep Vakulabharanam Exceed Technologies P Ltd No 153 Arcot Road, Sri Sai Square Valsarvakkam Chennai 600 087	Associate (Life)	Chennai
A-0885	Mr. Aniruddha Mukherjee Udayan 7 Chatterjee Street Barrackpur Kolkata 700 122	Associate	Calcutta
A(L)-0886	Mr. Dilip Kumar Pratiher B M W Industries Ltd 23A N. S. Road, 5th Floor Suite No 22 Kolkata 700 001	Associate (Life)	Calcutta
A-0887	Mr. Rajiv N Magal No 8, Puttarangana Layout I Cross, Seshadripuram, I Main Bangalore 560 020	Associate	Bangalore
A-0888	Ms. Nalini R. Magal No 8, Puttaranganna Layout Ist Cross Seshadripuram; I Main Bangalore 560 020	Associate	Bangalore
A(L)-0889	Mr. Jeyabalan Shundharabalan 157 E Subbiah Mudaliar Puram 5th Street Tuticorin 628 003	Associate Life)	Chennai
A(L)-0890	Ms Suma Khandige 940, I Block, III Stage Baraveshwarnagar Banglaore 560 079	Associate (Life)	Bangalore
A(L)-0891	Mr. D. V. S. S. Murthy Swati No 205 West of Chord Road Bangalore 560 079	Associate (Life)	Bangalore
S-0187	Ms. Priyanka Kataria 114 South Park Apts opp Chittaranjan Park New Delhi 110 019	Student	Delhi

S-0188	Mr. Mumku Mukherjee C/o Mr. Purnendu Mukherjee Vill- Murrah, PO & Dist Bankura 722101	Student	Calcutta
S-0189	Mr. Ashish Dewan A-1/303 Parampuneet Apts Plot 27, Sector 6 Dwarka 110 075	Student	Delhi
S-0190	Mr. Parijat Dasgupta D-17 Amarabati, Sodepur 24 Parganas 700 110	Student	Calcutta
S-0191	Mr. Prattusha Kar Qtr No B/504, Sector 13 Haldia Township Purba Medinipur 721 607	Student	Calcutta
S-0192	Ms. Arpita Khan Qtr No: 21/5/13 (IOC) Haldia Township Purba Medinipur 721 607	Student	Calcutta
S-0193	Mr. Sk Alauddin Ali Vill : Enayetpur; PO: Ghoshdiha PS: Keshpur 721156	Student	Calcutta
S-0194	Ms. Sucheta Mondal Jagadishpur; Palpara Rajarhat Kolkata 700135	Student	Calcutta
S-0195	Mr. Saorabh Kumar Mondal Haldia Police Qtr (Type 4 Room 3) Chiranjipur: PS Haldia 721 604	Student	Calcutta

Transfer of grade

ML)-1257	Mr. Pavail Gill House No 182 Sector 18/A Chandigarh	Member (Life) Transferred from A-0699	Delhi

New members admitted on 9th September 2005

M. No	Name & Addresses	Grade	Centre
I(L)-0117	Yagachi Auto Gadgets Pvt Ltd 34/1 Roopena Agrahara Hosur Road Bangalore 560 068	Institutional	Karnataka
IM(L)-0117	Mr. P. P. Hebber Yagachi Auto Gadgets Pvt Ltd 34/1 Roopena Agrahara Hosur Road Bangalore 560 068	Member Institutional Representative	Karnataka
F(L)-0530	Mr. A. K Pani S E (Planning), Delhi Region CPWD, Vidyut Bhawan Shankar Market New Delhi 100 001	Fellow (Life)	Delhi
F-0531	Wg.Cdr. Nand Kishore Wadhwa E-33 (1st Floor), Rajouri Garden New Delhi 110027	Fellow	Delhi
M-1215	Mr. Neeraj Singh G E India Industrial (P) Ltd 405 Kirtiman Kinariwala House Off. C. G. Raod, Ahmedabad 380 009	Member	Mumbai
M-1216	Mr. Jayant Mahesh Trivedi 8 Haveli Bungalow (Behind T V Tower) Drive In Road, Bodekdev Ahmedabad 380 054	Member	Mumbai
M-1217	Mr. Jayesh S. Mehta 6 Gitabag Society (near Parimal Crossing) Paldi, Ahmedabad, 380 007	Member	Mumbai
M-1221	Mr. Harshad Ramanlal Shah 18 Devansh Bungalow Thaltej, Ahmedabad 380 054	Member	Mumbai
M-1222	Mr. Anand Chinubhai Patel B-5 Balaji Avenue Judges Building Road, Vastrapur Ahmedabad	Member	Mumbai
M(L)-1223	Mr. K. V. Harinarayanan Flat 233, D Block Golden Corner Belandhur Gate, Sarjapur Road Bangalore 560 034	Member (Life)	Karnataka
M-1224	Mr. V. Ramachandran Bajaj Electricals Ltd 1-2-2/1 M. G. Road, Dorialguda Hyderabad 500 029	Member	Chennai
M- 1225	Mr. Rattan Kumar Mukherjee Bajaj Electricals limited 10 Ganesh Chandra Avenue Kolkata 700 013	Member	Calcutta
M(L)-1226	Mr. S Manjunath No 208, 4th Cross, 5th Block 3rd Phase, BSK 3rd Stage Bhuvaneshwari Nagar Bangalore 560 085	Member (Life)	Karnataka
M(L)-1227	Mr. Imtiaj Ali Shaukat Khan Asmita Orchid II, 303 /B Mira Road (E) Mumbai 401107	Member	Mumbai
M-1228	Mr. Sanjay Biswas 7-203 Jalvayu Enclave II Sector 20. Kharghar Navi Mumbai, 401 210	Member	Mumbai
M-1229	Mr. Sanjay Jain Bajaj Electrical Ltd 15/17 Sant Savta Marg Reay Road Mumbai 400 010	Member	Mumbai
M-1230	Mr. D. V. S. R. Sastry Bajaj Electricals Ltd 15/17 Sant Savta Marg Reay Road Mumbai 400 010	Member	Mumbai
M-1231	Mr. Kamalesh Soparkar Bajaj Electricals Ltd 15/17 Sant Savta Marg Reay Road, Mumbai 400 010	Member	Mumbai
M. 1232	Mr. Subrato Sarkar Z-703, Jal Vayu Vihar, Ph II Sector 20, Plot 22, Kharghar Navi Mumbai 401 210	Member	Mumbai
M-1233	Mr. Sudipta Ghoshal Bajaj Electricals Ltd 15/17 Sant Savta Marg, Reay Road Mumbai 400 010	Member	Mumbai
M-1234	Mr. Prakash Venkatesh Prabhu B-203 Cosmos Valley of Flowers Thakur Village, Kandivli (East) Mumbai 400 101	Member	Mumbai
M(L)-1235	Mr. Manjul Trehan Flat No: 14C, Block: B3B Janakpuri New Delhi 110058	Member(Life)	Delhi

M(L)-1236	Mr. Kishore Kumar Banerjee DG-II/286-C Vikas Puri New Delhi 110 018	Member (Life)	Delhi
M(L)-1237	Mr. Narain Singh B-5/234 Sector 8 Rohini Delhi 110 085	Member (Life)	Delhi
M(L)-1238	Mr. Ashutosh Kumar H.N- 161 Katwaria Sarai Hauz Khas New Delhi 110 016	Member (Life)	Delhi
M(L)-1239	Mr. Kuldip Singh Bedi F-81, Kirti Nagar New Delhi 110 015	Member (Life)	Delhi
M(L)-1240	Mr. Sanjay Kumar Khare Qtr No: 16A, Type -V, GH- 17 Paschim Vihar New Delhi 110 063	Member (Life)	Delhi
M-1241	Mr. Lokesh Kapoor C- 4/48, Yamuna Vihar Delhi 110 053	Member (Life)	Delhi
A-0864	Mr. N. Suresh Lumen Tech Pvt Ltd 301 Chancellors Chamber 1/33 Ulsoor road Bangalore 560 042	Associate	Karnataka
A-0865	Mr. Zameer Kagalwala LumenTech Pvt Ltd 301 Chancellors Chambers 1/33 Ulsoor Road Bangalore 560 042	Associate	Karnataka
A-0866	Mr. Aarish Kagalwala Razco Impex Pvt Ltd 301 Chancellors Chamber 1/33 Ulsoor Road Bangalore 560 042	Associate	Karnataka
A-0867	Ms. Hamida Kagalwala Lumen Tech Pvt Ltd 301 Chancellor Chamber 1/33 Ulsoor Road Bangalore 560 042	Associate	Karnataka
A-0868	Mr. Rajendra Gangadhar Nagelker 9/F ; Part 3, Ashapuri Sari Ghodasar Ahmedabad 380 050	Associate	Mumbai
A-0869	Mr. Saumil Bipinkumar Chandiwala C/302 Kaushambi (Nr. Mahlaxmi Char Rasta) Paldi Ahmedabad 380 007	Associate	Mumbai
A-0870	Mr. Rajesh Hasmukhbhai Parikh H-102 Management Enclave Nehru Park, Vastripur Ahmedabad	Associate	Mumbai
A-0871	Mr. Kuntal M. Mehta Som Electronics S 3 Vikzuni Ashram Road Ahmedabad 380 009	Associate	Mumbai
A-0872	Mr. Nilesh Dave The Solution Excellence F 25 Aryaman Awas Opp Sai Baba Temple Ahmedabad	Associate	Mumbai
A-0873	Mr. Kirit B Patel 3/C Apex Flats Ankur Road, Naranpura Ahmedabad 380013	Associate	Mumbai
A-0874	Ms. Shukla Indravadan M 40/238 Pragatinagar Naranpura Ahmedabad 380 013	Associate	Mumbai
A-0875	Mr. Jimmy S. Peters Engineering Design Group 7 Sharon Park, Satellite Road Ahmedabad 380 015	Associate	Mumbai
A-0876	Mr. Falgun J. Mehta 6 Gitabag Society, Paldi Ahmedabad 380 007	Associate	Mumbai
A-0877	Mr. Sudhir Sharma Astha Marketing 15 U/L Sursathi Business Management Centre Ambawadi Ahmedabad 380 006	Associate	Mumbai
A(L).0878	Mr. Mayur Kanubhai Sonpal Mayur Electro Tech Vrujbhoomi ASB 4, Ashwin Nagar Nashik 422 007	Associate (Life)	Mumbai
A-0879	Mr. Gautam Mahtani D 697, 2nd Floor Chittaranjan Park New Delhi 110 019	Associate	Delhi
A-0880	Ms Zeeba Mahtani D 697, 2nd Floor Chittaranjan Park New Delhi 110 019	Associate	Delhi
S-0186	Mr. Nehit Vij F- 406, Rashmi Apt. Harsh Vihar, Pitam Pura Delhi 110 034	Student	Delhi

Transfer of grade

M-1218	Mr. Milind Krishna Nagraj 6 Kashi Nivas Tilak Road, Ghatkopar (E) Mumbai 400 077	Member transferred from A-0377	Mumbai
M-1219	Mr. Ashim Datta Bajaj Electricals Ltd (E & P BU) 15/17 Sant Savta Marg Reay Road Mumbai 400 010	Member transferred from A-0464	Mumbai
M-1220	Mr. Purushottam Pandurang Jagtap Bajaj Electricals Ltd 15/17 Sant Savta Marg Reay Road Mumbai 400 010	Member transferred from A-0448	Mumbai

Lii 2005
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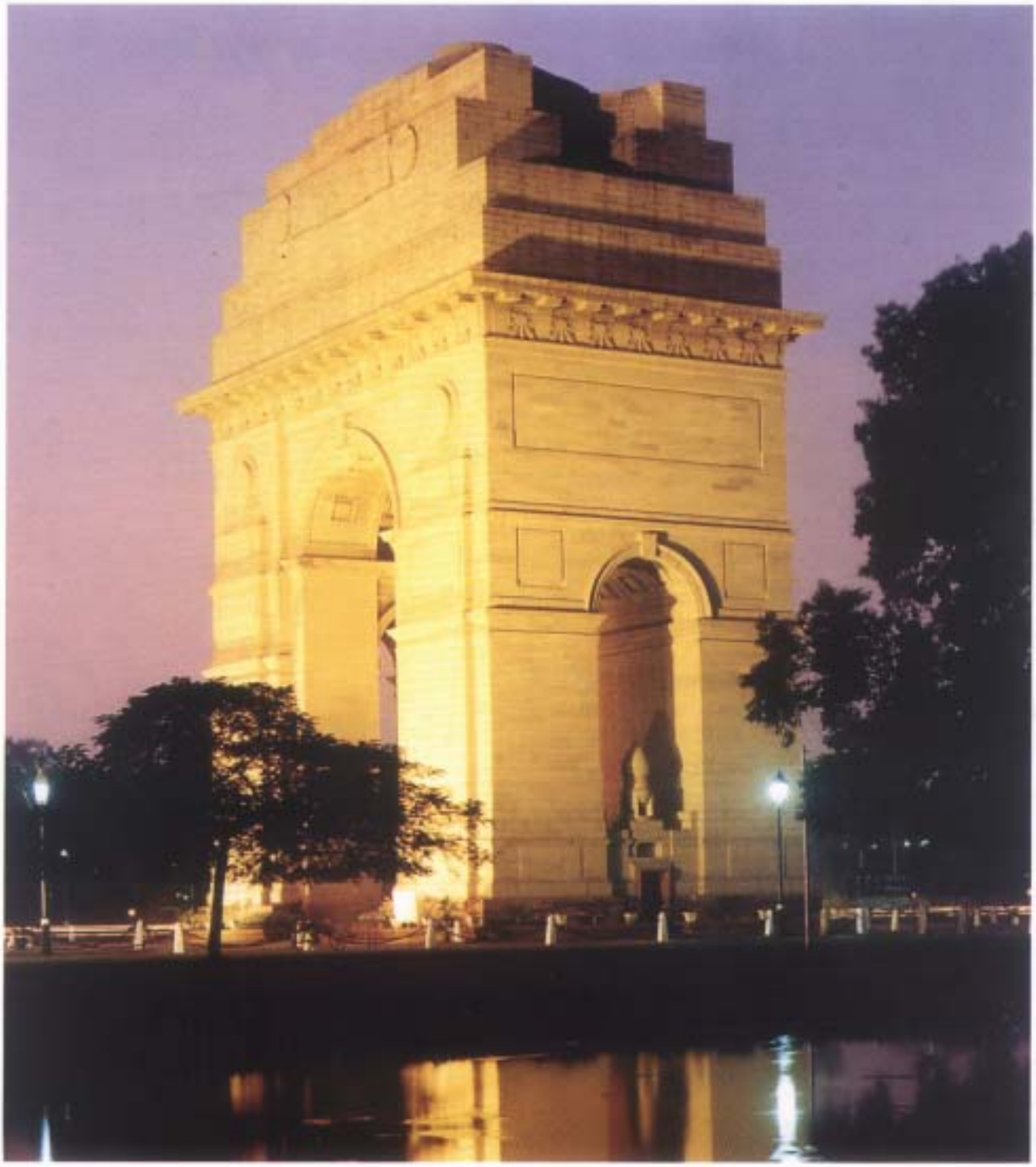
Light Shows

The indoor and outdoor spectacular light shows at Lii2005 by Modern Stage Service were a great attraction in the evenings.



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Tonight, as dusk gives way to darkness, Philips Lighting brings this national monument to light... Watch the beauty of the Dholepur stones come alive as light rekindles the memories of our true martyrs ...and great deeds.

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