

LIGHTING EQUIPMENT NEWS

JUNE 1993

Jobs shed at Thorn

GE Lighting and Thorn Lighting have announced plans to close two incandescent lamp factories, with the loss of almost 400 jobs. Production will be phased out over the next 18 months.

The factories, Rodney Lamp Plant, Wimbledon, and Preston Lamp Plant, Lancashire, are owned by Thorn and managed by GE.

When GE bought the light source business from Thorn in January 1991, an agreement was made whereby GE would not buy outright the three incandescent

lamp plants (Rodney, Preston and Merthyr) in the UK. Thorn would continue to own the plants for up to three years and during this time GE would manage the plants.

In a GE statement the company said this arrangement had been entered into because the company was not certain it could support three incandescent factories in the UK as well as its other incandescent plants in Europe.

GE's contract to manage the plants expires at the end of this year and therefore a decision had

to be made on the future of the two plants.

The third plant, at Merthyr Tydfil, was closed in November 1992.

Bob Merrill, vice president manufacturing for GE Lighting UK, said that consolidating UK incandescent production into one facility would make the total business more competitive over the longer term.

Ron Bartlett, Preston plant manager said in the GE statement: "We realise this is a difficult time for the people affected

and we plan to do everything possible to help employees make the transition to other jobs. We are hopeful that a number of employees will transfer to our incandescent plant at Leicester where we are planning to transfer over half of both plants' production."

A GE spokesperson was unable to say, at this stage, how many new jobs would be available at the Leicester plant.

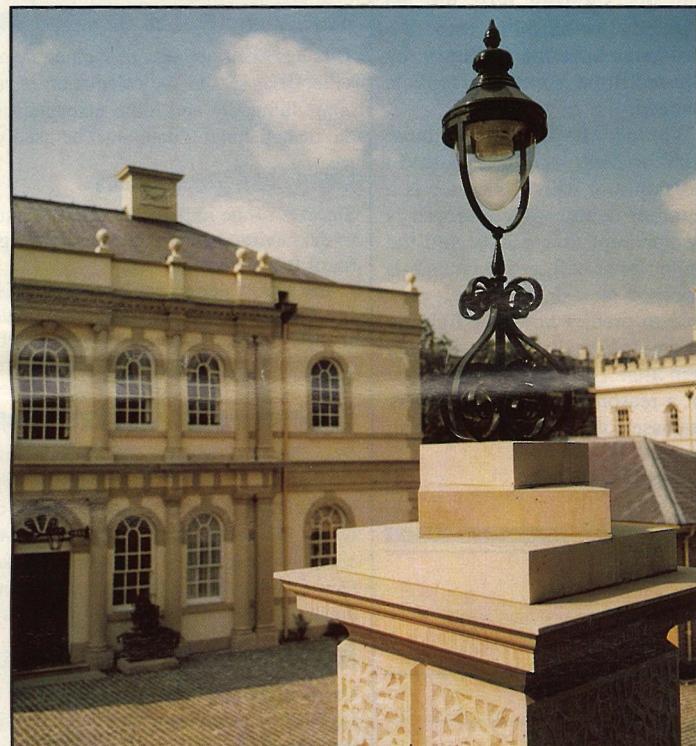
The cost of redundancies will be borne jointly by GE Lighting and Thorn Lighting.

Lanterns grace Quinlan Terry villas

Quinlan Terry's multi-million pound Veneto and Gothik villas in Regent's Park are illuminated by lanterns from D W Windsor. The Gothik villa has just been put on the market, with two Portland Lanterns at the entrance gates and a traditional Windsor Lantern to illuminate the front door. The adjacent Veneto villa features the same lanterns.

The Portland Lanterns stand sentinel on the entrance gateposts, mounted on 'U' frame brackets and ornate pedestals. The Windsor Lanterns frame the door lintels in specially designed Bow brackets.

Reader Service No 150



Luxury lanterns: DW Windsor's Portland lanterns in situ.

Roof lighting an environmental winner

Roof lighting was one of the factors in the judges' decision to name Grove Road Primary School, Hounslow, as winner in this year's Green Building of the Year Award, organised by the Heating and Ventilating Contractor's Association.

The school consumes 30% less energy than the national average because of the extensive use of roof lights, which provide around 2½ times more light than vertical windows.

Bill Watts, of consultant engineer to the project - Max Fordham & Partners, said: "The natu-

ral light at Grove Road is good enough to do without electric lights on all but the dullest days".

The school is located right under the flightpath to Heathrow airport, so another problem which the consultant successfully grappled with was noise pollution.

This was achieved, in the main, by doubling the thickness of the

roof sarking felt and plaster board.

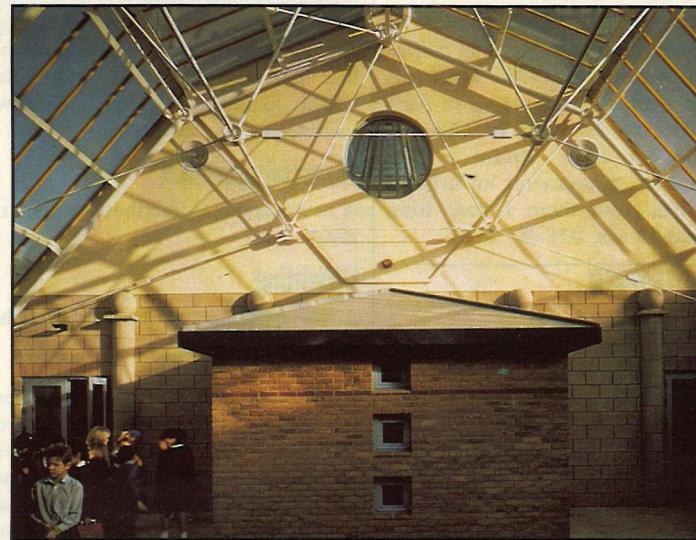
In addition the building is ventilated by bringing in air through floor vents rather than through open windows.

The Green Building of the Year

Award is co-sponsored by the

Independent on Sunday newspaper

and is supported by the RIBA, CIBSE, and BSRIA.



Winning windows: natural lighting keeps the bills down

Longlife bulb warning

May's edition of consumer magazine *Which?* carried a warning about the Litetronics SuperService light bulb.

Under test, the bulb failed to live up to its long life claims, lasting on average under 5,000 hours instead of the claimed 16,000 hours.

The bulbs, which the magazine claims probably cost more to run than ordinary bulbs, are sold through the Innovations and Buyers Guide catalogues.

In 1992 the Lighting Industry Federation complained to the Advertising Standards Authority about claims made in the Innovations catalogue regarding the bulb.

The complaint was upheld and the advertisers subsequently had to amend their copy, in particular to clarify that there was little energy saved by using the Litetronics bulb.

Which? also tested 25 compact fluorescent lamps currently available and concluded that all of them, even the most expensive, will eventually save the user money. The newer designs are more efficient, but also cost more.

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Reader Service No. 2

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LETTERS

A look to efficacy

Dear Sir

The flyer to Ted Page's article on tubular fluorescent lamps (LEN April 1993) refers to the greater efficiency and longer lives of the Oy Airam lamps he proceeds to discuss. There is little mention in the article of lamp efficacy - this and lamp efficiency are not the same thing - but lamp life is frequently quoted.

Without qualification lamp life is a meaningless concept when applied to any lamps dependent on an electrical discharge in a gas or vapour. Electrical lives of fluorescent tubes can approach 100,000 hours or more, depending on switching rate of course, but at such time the light output will have dropped to such a level as to make them useless in an installation purporting to have a minimum maintained illumination.

Average life is another concept commonly used. US manufacturers claim average lives of, for example, 24,000 hours; meaning the life, under prescribed switching conditions, at which 50% of the lamps have failed electrically. Again, not a very useful property.

Many manufacturers will specify a life at which the lumen output has reduced to, say, 90% of its value at 100 hours. This 'useful life' enables lighting engineers to design installations in compliance with reputable lighting codes and where the economic advantages of bulk lamp replacement, coupled with energy usage considerations, can be achieved. So please, no more loose talk about lamp life.

The mention of Seasonal Affected Disorder (SAD) is of interest, but could it be assumed this relates more to those countries which have little winter daylight? It is stated that 10,000 people in the UK are affected by SAD. It would be helpful if Mr Page could quote references in medical journals which substantiate this.

Disposal of toxic substances is mentioned. Of course, mercury is the most significant in fluorescent lamps. One manufacturer has enclosed, for many years now, an accurately measured (and there-

fore the minimum required) mercury dose in a glass phial, which is opened after pumping, gas filling and sealing.

With the claims made for the latest Oy Airam lamps may we expect these eventually to claim majority sales throughout the lighting world? Lamp manufacturers of the world beware!

Eur Ing I F Davies
Chartered Engineer

Life in the tube

Dear Sir

The interesting article by Ted Page of the Greenstock Lamp Co raises again the question 'just what is the economic life of the fluorescent lamp'? Is it best to operate them to extinction or replace them when their light output has reduced to unacceptable levels?

In the pursuit of efficiency and, by definition, energy conservation, one must consider the overall cost of lighting set against the result required. Clearly, the greatest cost for the vast majority of fluorescent lamp installations is the electricity used.

The long life of the Oy Airam range is welcomed if this extended life is complemented by an improved lumen maintenance factor. Unfortunately, the light output from any fluorescent lamp continuously deteriorates with use and a sound economic case can be made to replace them when this has fallen by 20-30%.

The need for planned lighting maintenance will be highlighted by the 'designed maintained illuminance' approach which will be introduced in the next CIBSE Code. Lighting designers will need to determine the economic life of the lamps they use in a design alongside what maintenance they recommend.

Conserving the world's energy resources is in everyone's interest, but this is unlikely to be achieved by having to install more fluorescent lamps to compensate for the light loss which results from burning lamps to extinction.

W J Walker
Consultant to Parkersell
Services Ltd

Voltage change

Dear Sir

There was one small item in your April issue that caught my attention. From 1995 the UK will reduce its low voltage public electricity supply to a normal 230V to harmonise with other EC countries.

Bearing in mind the sensitivity of light sources to changes in voltage I wondered why this item was on the back page and carried no comment about the likely effect on lighting.

Enquiries about what is happening within the lighting industry to deal with this change have produced a confusing array of replies.

There are many who are unaware of any change and thus will continue to supply 240V equipment and lamps. Others say the change is cosmetic and although the nominal supply voltage will be stated as 230V, it will be 240V from the same unaltered supply system. This is possible because the upper tolerance will be increased from +6% for 240V to +10% for 230V. The upper limit therefore remains almost the same at about 253V.

A third faction say the supply voltage will be reduced to 230V from Jan 1995 and lamps and control gear will have to be modified accordingly.

It would seem that clarification is urgently needed otherwise the end user is likely to suffer from poor lighting. How can the lighting designers and engineers specify either performance or equipment if it is not crystal clear what supply voltage will prevail after 1 Jan 1995?

If the supply is reduced to 230V then filament lamps will last twice as long but with a reduced light output of about 15-20% but a reduced power consumption of only 7-10%. Dis-

charge lamps will also decrease in light output by about 10% which could dramatically reduce the useful life of high pressure sodium lamps by about a third.

Conversely if 230V versions are installed when the supply remains at 240V then short lamp life of filament lamps will soon become apparent. GLS lamps may not be the best economical solution for general lighting, but if microfiche readers, slide and overhead projectors, and the like, are set for 230V then twice as many expensive projector lamps will be required.

For this uncertainty to occur at a time when the concept of maintained illuminance is being introduced is unfortunate. The lighting fraternity have enough difficulty determining when the minimum average illuminance will occur. If there is doubt as to whether the supply voltage matches that required by the lighting equipment then their task becomes almost impossible.

Your short statement says the existing domestic appliances will operate at the new voltage without adjustment. Possibly people will not notice the slightly longer time it takes for a kettle to boil but I think it is incorrect to say that the lighting will not be affected. Furthermore very few luminaires have the facility to be adjusted if the incoming supply is changed.

Whether the UK should have 230V or 240V may be a political decision and which is better is a separate debate. My concern is the apparent uncertainty and the limited time before this change is supposed to take place. Is it possible to predict how any lighting scheme planned today will perform after 1st Jan 1995? And is it not a reasonable question for any purchaser of lighting to expect an answer?

Richard Forster

CIBSE

The Chartered Institution of Building Services Engineers

Lighting - The Way Ahead

The 1993 CIBSE Code

As the long-awaited fifteenth edition of the CIBSE Code for Interior Lighting nears publication, the Code Chairman, Robin Aldworth, outlines the principal changes and innovations in CIBSE's guidance to best practice in modern lighting design.

The new Code will contain many changes, though the layout and structure of the '84 edition have been retained.

There are many more cross references within the text and a fuller index. It is recommended that users read the Code at least once before using it as a reference document. The major changes in the 1993 edition are listed below:

Maintained illuminance replaces service illuminance

The illuminance recommendations are based on 'maintained' illuminance rather than 'service' illuminance. This alters the value and the definition of 'maintenance factor' used in calculations; the term now includes lamp luminous flux (lumen) maintenance and life survival. This change is in response to the CIBSE Lighting Division policy statement of June 1989. The aim is to ensure harmonisation, during the life of this edition, with European lighting recommendations currently being drawn up within the European Committee for Standardisation (CEN).

The maintained illuminance values in the Schedule are now true minima which result in higher initial illuminance and installed loads. To minimise these increases, maintenance procedures become a more important element in the design process. The flow chart has also been revised to include intermediate steps in the illuminance scale which designers and users can apply when setting the Design Maintained Illuminance.

General information on lamps and luminaires

This has been updated to include developments since the last edition. To assist designers in the calculation of maintained illuminance some typical lamp, luminaire and room maintenance data has been included. However, the manufacturer's data must be used when this is available.

Energy and green issues

Since 1984 the importance of these issues has come to the fore in response to the environmental concerns about 'global warming' and emissions from fossil fuel power stations.

The 1993 Code places more emphasis throughout on energy load and use. The Energy section has been substantially revised and includes target ranges of installed power density (W/m²/100lux). The information on the range, design and availability of lighting control systems has also been expanded.

EC Directives and standardisation

New EC Directives for the working environment have been published since the last edition. These are taken into consideration in this Code. In particular, legislation controlling the use of visual displays now has a significant impact on the design of commercial and industrial lighting. Throughout, new references to relevant EC Directives and associated standards have been added. A new appendix covering this area, has been introduced. Reference to Quality Assurance BS5750/ISO 9000/EN29000 has also been included.

Recommendations for all interiors and activities

Users of previous editions of the Code have not always appreciated that the Lighting Schedule provided only specific recommendations which vary with the activity or interior. The intention was that these should be applied in addition to the other recommendations. This resulted in the Schedule being adopted without taking account of the general recommendations.

The new Code emphasises that there are 'core recommendations' which apply to all areas and the Lighting Schedule and flow chart which give extra recommendations tailored to specific tasks, interiors and activities.

Illuminance selections

In response to requests from users, an appendix has been added which explains how illuminance recommendations can be related to visual performance.

Illuminance variation

More detailed advice and recommendations are given about the variation of illuminance in an interior in terms of uniformity and diversity.

Daylighting

Separate recommendations are now given for daylighting to enhance the general brightness of a room and daylight for tasks. The Code assumes that daylighting and electric lighting are used together in many buildings but that most users of the Code have little influence on window design. The CIBSE Application Manual - Window Design is referred to for specific guidance on window design.

Financial appraisal

A new appendix describes methods of financial appraisal of a lighting installation.

Uplighting

A new appendix describes indirect lighting, calculation methods.

The 'art' of lighting

Based on the argument that 'art' cannot be codified, previous editions of the CIBSE Code have consciously avoided this topic. In the new edition the first steps have been taken to provide advice on lighting design which goes beyond purely task orientated concepts; to express architecture, create mood or provide emphasis. For the future, it is hoped that this subject will be developed and more guidance given in supplementary publications.

Robin Aldworth

Chairman, CIBSE Code Task Group

DIARY

JUNE

6-10 Interior Design International '93. Exhibition in London, including interior lighting companies. Details from Nicola West, 071-486 1951.

12-16

Euroshop '93. To be held in Dusseldorf, Germany for shopfitting, display and merchandising - including 120 lighting companies. Details from Eva Rugenstein, 49.211 4560 5411.

15

Electricity at Work Regulations 1989. One-day seminar in London organised by the IEEIE. Details from 071 497 9006.

17

Sign UK '93. Exhibition at the NEC, Birmingham, expected to attract over 3,000 buyers, specifiers, designers and signmakers. Details from Maurice Hoare, 081-302 8585.

24

Safe Design of Electrical and Electronic Products. Workshop at ERA Technology's R&D complex in Leatherhead. Details from 0372 374151, ext 2288 or 2461.

JULY

1 **Emergency Lighting - Design and Practice.** Seminar in London organised by the Mid Career College. Details from the College 0223 880016.

1

Periodic Inspection and Testing of Electrical Installations. One-day seminar in Cardiff organised by the IEEIE. Details from 071 497 9006.

AUGUST

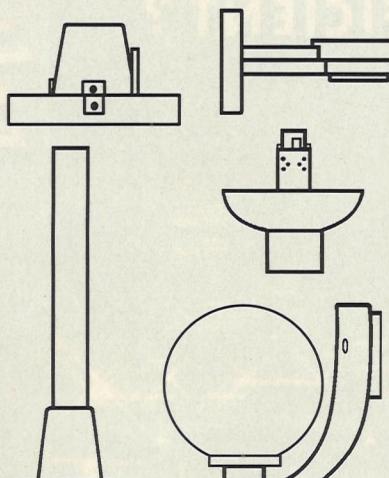
3 **Elenex Australia '93.** The definitive exhibition for the electrical and electronics industries in Australia, to be held in Sydney. BEAMA have obtained DTI financial support for an official British group there. Details from Rosie Lewis, 071-487 5831.

SEPTEMBER

12-15 **The Plasa Light and Sound Show** at Earls Court, London. Organised by Philbeach Events. Exhibition for lighting, sound and special effects technology for live entertainment, TV and film sectors. It now also caters for theme parks and interior design etc. Details from 071 370 8215.

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NEWS

Designing with light

The Design Council has published a new book which is intended to be an introductory guide to the theory and practice of designing with light.

Lighting Design is said to be a wide ranging, readable source book which fills a critical gap within the commercial and contract design world. It is aimed at interior and exhibition designers, architects, lighting manufacturers, facilities managers, design academics and design students.

The book begins with a discussion on the nature of light, going on to focus on key areas such as lighting technology, one-off tailor-made lighting systems, exterior lighting, energy conservation and the work of lighting designers. It also covers detailed case studies of prestigious lighting schemes. The final chapter speculates about the future and how lighting design might look in the early years of the next century.

The book was written by Carl Gardner, a freelance writer, editor and consultant, and Barry Hannaford, a director of Lighting Design Partnership. It costs £45 and is available from bookshops including the Design Council Bookshop, 28 Haymarket, London SW1Y 4SU.

More R&D at Amberlec

Menvier-Amberlec has opened new research and development facilities at its Leeds plant, doubling its previous R&D capacity.

The company designs and manufactures central battery and inverter systems for emergency lighting and stand-by power supplies. This latest R&D investment enables the company to do all its R&D work in-house.

It also expands the company's ability to customise products and will improve the speed of service offered by its network of project engineers.

Reader Service No 163

In brief...

• Kaufel Group Ltd, the parent company of Emergi-Lite Safety Systems Ltd, has completed the acquisition of three emergency lighting manufacturing companies in France. Comptoir General Impex SA, Ratec SA and Elaul SA will now report to Kaufel Europe.

• Whitcroft plc has acquired the remaining 20% shareholding in Industria Beheer BV - its Netherlands-based manufacturer and supplier of industrial and exterior lighting - for £2.16 million.

• Ross Electrical, the Scottish distribution arm of Newey & Eyre, is expanding its service to contractors on the east coast with the opening of a new branch at Arbroath.

• JT Ltd, the managing agent for training in the electrical installation and allied industries, has relocated its northern region offices to Wrexham, north Wales.

• Custom low energy electronics house SimmTronic has now added a design consultancy division. A full design capability is offered from concept and aesthetics to full production engineering.

• Space sold for Lightex '93, to be held in Bournemouth from 14-16 September, is already 20% up on space booked at the last exhibition in 1991.



Careful dimming for circular building

Alpa Lighting has recently fulfilled a contract to supply the lighting for offices of the new Lloyds Bank, Bristol, which occupy three levels in the unusual circular building which surrounds an open courtyard. The luminaires, with their slotted louvres, were fixed to the air extract ducts which, in turn, were mounted to the top of the coffers radiating from the hub and forming the ceiling.

The ceiling tiles were designed to remain level with the lower face of the luminaire, whilst floating within the coffers and allowing return air to flow past them into the air extract ducts. A single row of fittings was installed within each coffer, with a 70W fluorescent lamp at each end and six 36W lamps in between. In total, the project involved 138 coffers per floor, with 5500m of trunking and 3312 fluorescent luminaires.

The close proximity of the rows of luminaires meant it was necessary to dim the lamps to achieve the specified 550 lux. Because the luminaires are divergent, those nearer the hub required greater dimming than those at the outside of the build-

ing. Alpa, therefore, had to determine by calculation and measurement, the level of dimming required for each lamp, and then to prove the results under laboratory conditions in its test facility. The tests also had to determine the ratio of air extraction over a length of duct 12.5m, and the size, shape and distribution of the air extract slots in the face of the duct for each air flow rate.

Helvar 1x70W and 2x36W high frequency electronic ballasts were specified and resistors were fitted to the 10V dc dimming circuits in order to pre-set the dimming levels.

There has recently been an addition of some cellular meeting rooms in the building and for these areas it was necessary to develop an air handling down-lighter with an acoustic hood to prevent cross-talk via the common plenum. This fitting was designed, developed and tested by Alpa, based on twin 18W compact fluorescent lamps, dimming high frequency control gear, with an annular ring in the bezel for air flow. The acoustic hood was manufactured to the specification of consultants Arup Associates.

Reader Service No 164

Papers in print

The list of papers chosen for the CLIMA 2000 conference in London in November has now been published. Of the 250 on the list, 80 have been chosen as oral presentations.

Technical sessions at the conference will cover lighting, air conditioning, energy and environment, fire and smoke, heating, indoor thermal environment, refrigeration, ventilation, BEMS, health, computer modelling and building physics.

Further information, conference brochures and registration forms are available from CIBSE Member Services Department, 081 675 5211.

Design move

Luminaire and emergency lighting manufacturer Future Designs Ltd has moved to a new premises as part of a planned expansion programme.

The factory and offices in Croydon will provide, in particular, for the expansion of the company's mains and emergency luminaire production and provide facilities for the research and development of custom designed units.

To coincide with the move a new catalogue has been produced displaying the company's range of standard luminaires, photometric data and emergency lighting.

Reader Service No 165

BEAMA changes

The council of the Federation of British Electrotechnical and Allied Manufacturers' Associations (BEAMA) has endorsed the appointments of Mr I Baum, commercial manager of Hawker

Siddeley Switchgear, and Mr J Winn, general manager of Ceg-elec Projects Ltd, to the BEAMA contract committee.

The number of member companies of BEAMA has risen to 528 with the recent addition of Peak Measurement Ltd.

Shake up at Chloride Bardic

A management shake up at Chloride Bardic is aimed to reverse the company's flagging fortunes and put it back at the top of the emergency lighting market.

New appointments at senior level have been made from outside the organisation, including managing director Andrew Lowe, who was formerly with the Dowty Group.

In recent years the company has suffered from industrial action and relocation, contributing to the company's falling market share.

Mr Lowe's first priority will be to return the company to a profitable position within the coming 12 months. This will involve changes in the delivery process, where the company has previously fallen down, to ensure that products leave the factory on time.

In the longer term the company will invest substantially in research and development. It intends to introduce new products at regular intervals over the next two years.

The company is also to address itself to distribution - expanding and strengthening its distributor network with approximately 40 new outlets planned.

The new management team charged with carrying out the planned changes includes: David Lancaster, manufacturing manager; Roy Stoner, export manager; Peter Collum, UK sales and marketing manager; and Alan Daniels, technical manager.

Reader Service No 166

New head at CELMA

Theo Hüttmann has been elected chairman of the Committee of European Luminaires Manufacturers' Associations (CELMA). He is also chairman of the Electric Luminaires Association within the German Central Federation of the Electrical Engineering and Electronics Industry and the director of the lighting technology business sector at AEG.

On taking office, he voiced the view that the major opportunities for the European lighting industry are to be found especially in the marketing of energy-saving lighting systems. He said that the overall European market volume was stagnating at around eight billion ECU, while at the same time there was still largely unexploited growth potential in professional lighting through the use of low power-loss electronic operating systems.

Call for papers

The organisers of the National Lighting Conference have made a call for papers on all subjects in the field of electrical and natural lighting.

The conference will take place next year, from 27-30 March, at Robinson College Cambridge, and aims to inform delegates of recent developments in lighting.

The organiser, the Lighting Division of the Chartered Institute of Building Services Engineers, is calling for contributions particularly on new concerns such as light pollution and the EC VDT Directive.

Further information is available from the CIBSE Lighting Division conference committee, 081-675 5211.

COMMENT

Seeking a lighter burden

One of the greatest burdens a magazine editor has to bear is the need for extensive socialising to keep in touch with the industry. Inevitably, this leads to long hours in such dens of iniquity as pubs and restaurants and one can't help but notice the standards of lighting in these places.

This does, of course, vary from place to place but it seems in general that there is little thought given to the lighting design in these eating and watering holes (black holes of Calcutta in some places).

Without any statistical analysis to back this up, I would say that restaurants generally score better on this point. This is particularly true of restaurant chains which perhaps have an in-house design team. Frequently one sees smaller restaurants where someone has tried to create an atmosphere appropriate to the pursuit of pleasures of the flesh. Very often, though, they have merely succeeded in creating a hazardous area for waiting staff and anyone else who tries to move around the place.

Pubs seem to vary greatly in their overall design and fortunes are frequently spent in refurbishment. But so often the lighting stays the same and tacky wall-mounted candelabra efforts are the norm rather than the exception. And the extensive use of incandescent lamps is quite extraordinary.

One can definitely be forgiven for feeling that lighting design in pubs and restaurants is neglected. Many people would say these are just examples of a much wider neglect. So is this the fault of the designers for not addressing this aspect of their design? Or is it the fault of the lighting industry for not making them aware of what the options are?

A few years ago such criticism of the lighting industry may well have been valid but I'm not sure this would be the case now. I frequently come across companies which run seminars and road shows, go to exhibitions and produce genuinely informative publications. They all say their biggest problem is getting the attention of the designers who could benefit from such knowledge.

It seems that part of the problem is that designers are wary of going to events organised by manufacturers and distributors because they are expecting to be sold to rather than educated. And obviously these companies have a vested interest in selling their products. But they can only do that effectively to an informed customer base. In most cases, therefore, the priority is to educate rather than indoctrinate.

So, if you're a designer who has missed out on these opportunities to broaden your horizons, please be reassured. A greater awareness of lighting will be better for your designs, better for the lighting industry and infinitely better for us poor hedonists.

Paul Haddesley

LIGHTING EQUIPMENT NEWS

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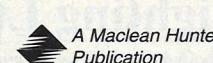
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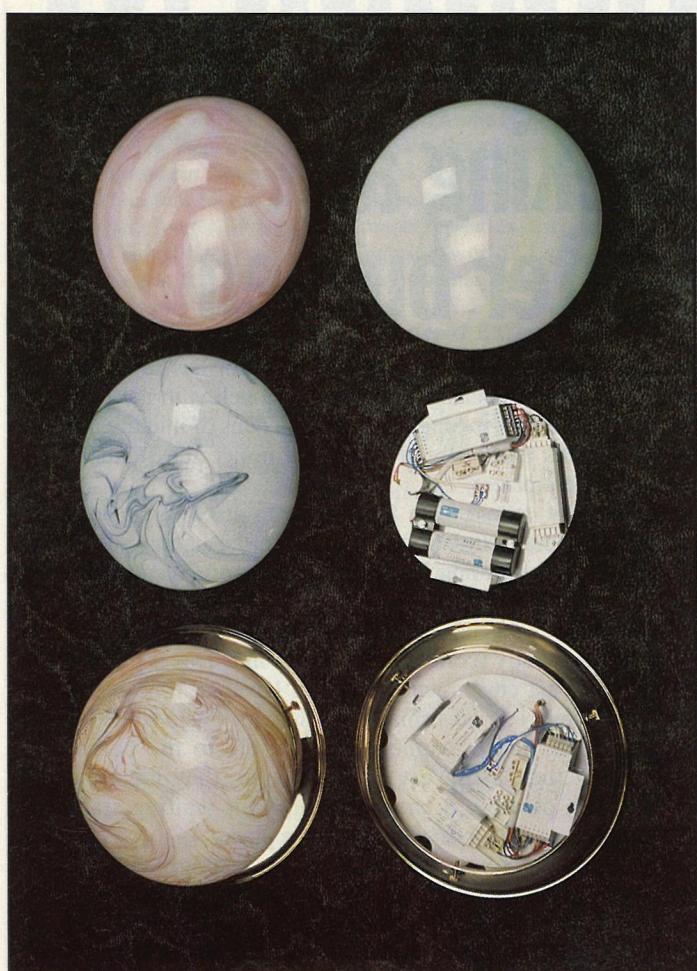
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NEW PRODUCTS



Harmonised fittings

Arden Manufacturing has produced a harmonised range of emergency lighting fittings. The glass covers are available in a wide range of colours and patterns which can co-ordinate with other light fittings in a scheme.

Reader Service No 167

Each fitting is a three hour maintained emergency module manufactured to BS5750. The rechargeable nickel cadmium cells are of a high temperature variety providing at least a year's life.

Reader Service No 167

The optimum concept

D W Windsor is launching its new Optima Series of exterior lighting this summer. Described as having a contemporary style, these products will run alongside the company's heritage range and will offer versatility of luminaire shapes.

According to D W Windsor, research amongst lighting engineers revealed a need for a product range offering excellent light-

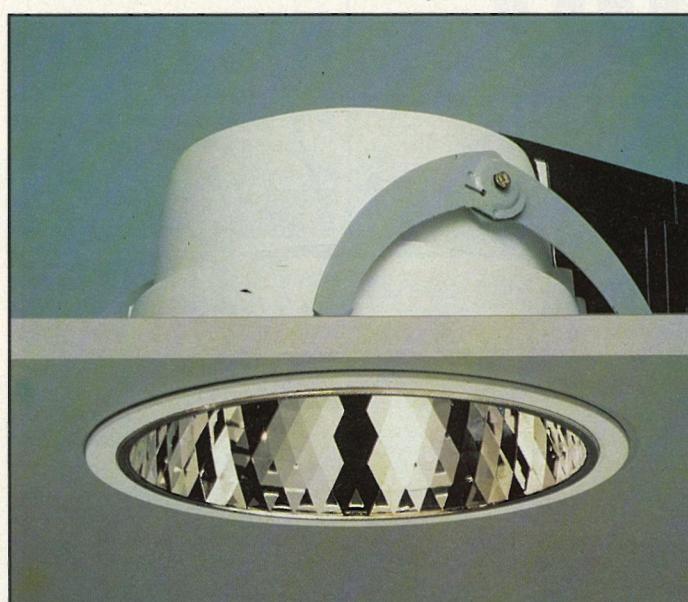
ing performance, high ingress protection, quick and easy maintenance - all at low cost. This product range is designed to meet that need and is said to be suitable for a range of applications, including urban centres, subsidiary and access roads, amenity areas and aesthetically sensitive residential areas.

The concept of the Optima Series revolves around a selection of modern shapes with a central die-cast aluminium ring and a range of hood and glazing combinations. There are seven main shapes which allow variations in

Solely indirect lighting

Guzzini offers two new ranges; the Base Light and Sistema 44. The Base Light range is a style of luminaire utilising solely indirect lighting. The light sources (compact fluorescent) are shielded by aluminium reflectors which direct the light into the vaulted centre of the fitting. The effect is a wide angle beam which produces a clean lighting distribution and is ideal for creating a differentiated practical illuminating fitting. It also has the advantage of using popular low energy lighting sources.

The system is similar to traditional fluorescent systems in dimension and therefore interchangeable. The luminaires are produced in four sizes which are suitable for the most common standard false ceiling panels. The terminal blocks are fast coupling



so as to simplify installation.

Sistema 44 is a range of low energy downlighters. The name lends itself to the IP44 rating of all the luminaires. Manufactured from ABS plastic, the body is

flame resistant to a temperature of 850°. Class II double insulation is applied throughout, and emergency inverter packs are available. The range starts with fittings accommodating 2 x 7W PL com-

pact fluorescent lamps, through to 2 x 26W lamps.

Sistema 44 uses a patented fixing system which allows the fittings to be installed into ceilings with different thicknesses, while giving even support. The locking system ensures that the fitting is locked in position rigidly, and therefore not susceptible to vibration. However, release of the clips ensures that the luminaire can be removed from the ceiling which is particularly important on Emergency luminaires where British Standards state that batteries must be replaced every three years.

The luminaire complies with all European Standards, claims Guzzini, including the 'F' mark which means that the body temperature in the contact areas with the ceiling never exceeds 90°. This means that it can be installed on areas with highly flammable surfaces such as carpets, cloth and wood.

Reader Service No 168

Long life reflector lamps

Greenstock's new reflector lamp has a rated life of 10,000 hours - 10 times the life of a normal lamp. Ideal for use in shops, hotels and restaurants which use conventional reflector or 'spot' lamps for display lighting, the lamps are rugged in construction, so having extended life and needing less maintenance through less frequent lamp changes, the company claims.



Greenstock reflector lamps are direct replacements for existing models and are available with ES caps in R63, R80 and R95 versions,

and four different Wattages. The lamps also comply with the European and British safety standards.

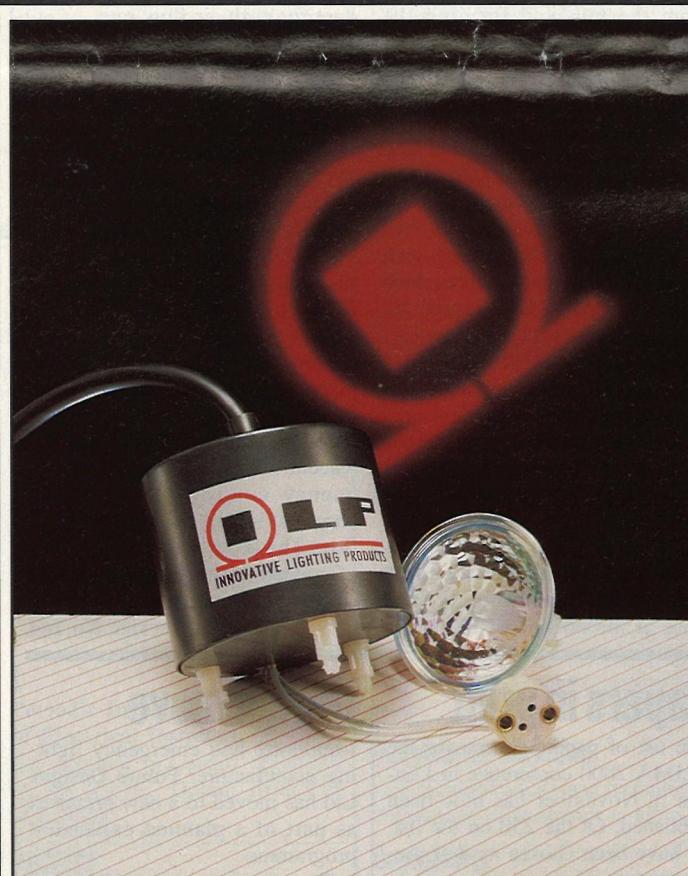
Reader Service No 169

Low voltage footlights

LightGraphix has launched a new range of high quality, low voltage footlights, designed especially to illuminate the borders of gardens and pathways.

The footlights use 20W 12V halogen lamps and can be recessed into exterior and interior pathways and walls, or into the ground. Available in square or circular form, the lights are manufactured in a die-cast aluminium body and bezel. Units are also available for low voltage tungsten halogen lamps. The cover is made of toughened glass, enabling the customer to walk or even drive over the footlight without fear of breakage.

The rectangular footlight or wall lights are manufactured in die-cast aluminium and can have the following sources: halogen 20W capsule, 35mm dichroic



Integrated low voltage

240V AC 50Hz supply and is suitable for use with all 20-50VA dichroic tungsten halogen lamps. It is fully dimmable with all conforming dimmers and indefinite short circuit and overload protection is also provided which resets automatically once the fault is removed.

The construction of the trans-

former also addresses the problem of heat dissipation and, according to ILP, can be sited on the back of the fitting without any problem. The plated through hole printed circuit board is potted with flame retardant polyurethane compound into an ABS case and is said to allow operation even with a maximum case temperature up to 95°C.

Reader Service No 174



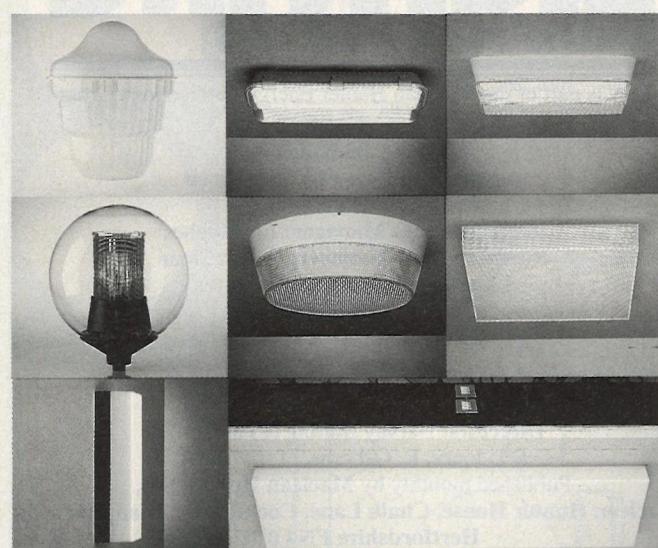
MR11, AR48, compact fluorescent 120V 60Hz - 230/240V 50Hz - AC12V or 24VDC and incandescent lamps.

LightGraphix also supplies a range of self-adhesive numerals and logos which can be attached to wall lights for customers who wish to use the lights as an illuminated sign.

Reader Service No 175

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Reader Service No 4

Page 4

Lighting Equipment News, June 1993

NEW PRODUCTS

3D integral lighting

Ecophon Pilkington has introduced two new products, Curve and Etage, which provide three-dimensional lighting for multi-level ceilings. They can be used in combination with many types of ceiling.

Curve is an extruded aluminium grid which can incorporate concealed luminaires and is used in multi-level ceilings or can form continuous pelmet uplighting along a wall. Etage is a complementary extrusion to Curve, returning the ceiling to the horizontal plane. Etage can be used in matching pairs where uplighting is not required.

Etage and Curve provide cost-effective, practical solutions to many problems commonly encountered when installing or refurbishing ceilings. For example, where a ceiling is required to dip below bulky service ducting, Curve can transform conventional upstands into a functional yet attractive detail by providing integrated lighting.

In buildings where the room height varies and is restricted by the pitch of the roof, the choice



has previously been between a low ceiling throughout or an unsightly bulkhead. Curve allows the designer to incorporate concealed, glare-free uplighting while maximising the ceiling height throughout.

Coffers can be used to enhance the visual appearance of any ceiling and are particularly useful

where room height could be restricted by structural beams. Ecophon provides standard coffer kits in two styles to simplify the specification process, and special corners can be pre-formed to individual client specifications.

Using in-house computer-aided design systems to calculate light levels in advance and prepare lay-

outs and design details, the company claims it can transform the client's original concept into a high quality finished installation.

Curve and Etage are pre-finished complete systems including pre-mitted internal and external corners for rapid and accurate installation.

Reader Service No 176



wedge cross blades which satisfy LG3 categories 2 and 3.

The luminaires can be factory fitted for integral or remote emer-

gency lighting. Control gear is HPF switchstart, with other options also available.

Reader Service No. 177

In Brief ...

● The HL60WD is a new solid state electronic transformer for low voltage lighting applications from Hi-Lux International. It is manufactured with a self-regulating operating range of 20-60VA, so that one unit can be used with a variety of applications. It is said to be suitable for both domestic and industrial applications and is available at a trade price of £14.20 (plus VAT).

Reader Service No 178

● C P Electronics Ltd has developed a new touch operated electronic time lag switch, described as unique, for hall and staircase lighting. Designated KH2, it has two wire control, does not require a neutral connection and will switch standard fluorescent lamps, economy lamps such as PL and 2D and incandescent lamps. Reader Service No 179

Pendant luminaires

Syncrolux is the latest luminaire from RADA Lighting for pendant or close ceiling mounting. It is available in a comprehensive range of sizes and variants for different lighting schemes.

All the linear models can be mounted individually or continuously and pendant models include a prismatic acrylic top panel to provide diffused upward comfort lighting on high or vaulted ceilings. Altogether there are 19 models, from single lamp to four lamp, including five modular fittings from 300mm x 300mm to 650mm x 650mm.

The luminaires are fitted with low iridescence aluminium, low brightness louvres with curved sides, closed ends and profiled

wedge cross blades which satisfy LG3 categories 2 and 3.

The luminaires can be factory fitted for integral or remote emer-

gency lighting. Control gear is HPF switchstart, with other options also available.

Reader Service No. 177

Reduced heat is said to make the system particularly suitable for undershell lighting, as the lower temperature has no adverse effect on stock.

The unit is water resistant and will strike at -5°C, using a soft

strike system. It will detect a failed lamp on the circuit and, after failing to strike eight times, will shut down.

The drive can be used with any four pin fluorescent.

Reader Service No 180

Intelligent controller

Coolite has introduced an intelligent 24V DC fluorescent control system, claimed to be the coolest

running, most energy efficient fluorescent lighting system available.

CREATIVE & VERSATILE

We are pleased to introduce the five light imperial fitting which unusually can be converted to accommodate the latest low energy lamps.



Finished in polished brass or antique the fitting is also available in a two tier system to customers requirements.

Suitable for sale through retail shops or contract installations in hotels, restaurants and pubs with matching colour co-ordinated wall lights.

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Reader Service No. 5

Lighting Equipment News, June 1993



LIF LINE

Emergency lighting - impending amendments

Drafts produced by the CEN and CENELEC working groups on European standards (BS5266 and EN60.598.2.22) will be circulated for National Comment during the summer. They include a new product standard for central emergency power systems (excluding generators), two drafts to amend or replace BS5266 and cover the luminous requirements for emergency lighting schemes, and an application standard for emergency lighting systems.

Workplace Directive

In effect, any building where people are employed, or even self-employed, may have to comply with specific emergency lighting and exit sign requirements. This Directive is retrospective, ie it requires that ALL places of works are brought up to standard.

Safety Signs Directive

Also retrospective, this calls for the provision of emergency signs in all places of work, and will require that these signs are regularly cleaned, tested and maintained, and visible at all time. Traditional 'EXIT' signs will be replaced by the 'running man'.

Construction Products Directive

Primarily this should ensure that escape routes of new buildings are usable at all times and, where applicable, escape routes have emergency lighting systems and exit signs. Interpretative documents are currently being drawn up, and mandates issued, for standards defining the need for a minimum level of illumination, particularly where potentially hazardous equipment or plant is being used. In a situation where equipment may be shut down during the evacuation of a building, the Standard may require minimum levels of emergency lighting illumination in the immediate vicinity of the equipment.

In the UK

1. The absolute minimum light level on defined escape routes for most of Europe will probably be 1 lux. However, the National Standards Committee may apply for a special condition allowing 0.2 lux for permanently unobstructed escape routes.

2. The procedure for calculating the light level for Open Areas will be greatly simplified, both for design and verification. While changes will benefit specifiers and inspectors, the levels proposed are similar to current ones. Expect a move from 1 lux average to 0.5 lux minimum.

3. An additional category will be included to cover what are defined as High Risk Task Areas. Here emergency illumination equivalent to 10% of normal lighting levels or 15 lux, whichever is the greater, will have to be provided.

4. Safety sign illumination levels and viewing distances may be more specifically defined with the 'running man' replacing BS5499.

Application standard

Much of the good engineering practice defined in BS5266 and ICEL:1003:1982 corresponds with the experience of our European colleagues and major requirements are:

1. Emergency lighting must be activated in the event of local sub-circuit supply failure.
2. Each compartment of an escape route should have at least two luminaires to guard against total darkness.
3. Specific locations of hazards such as plant rooms, lifts, toilets and escalators should be protected.

4. Extended time duration and forms of operation are defined as necessary in the event of non-evacuation during supply failure, or if the normal lighting can be dimmed.

5. Commissioning and subsequent test, together with maintenance procedures and system record requirements, to be clearly detailed.

Associated application standard - Luminaire Data Presentation

CEN TC 169 WG7 is responsible for producing a standard on the measurement and presentation of photometric data. It defines the procedure required to provide consistent verified data, so that specifiers can compare different manufacturers' units on the same database. For emergency lighting the mandatory third party verification of photometric data is likely.

The current draft for Emergency Lighting Data is based on the ICEL photometry scheme requirements. When used in conjunction with approved luminaires from a factory operating BS5750, one can be confident of a system design which takes account of the maximum performance degradation likely to occur during the system's life.

Product standards - Luminaires - EN60 598-2-22

Published in the UK as BS4533.102.22 two important items have been omitted, hence the ICEL product registration scheme was developed. The items excluded are:

1. A test of self extinguishing housings as required by BS5266 for exit routes.
2. Verification of the photometric performance of the luminaire. To enable an engineer to design a system, it is essential that consistent accurate data can be used.

Future amendments coming from IEC 598 WG LUMEX may well cover these points and further amend the product standard to include slave luminaires and other requirements developed out of the CEN and CENELEC work.

Exit signs - ISO6309

This Standard defines the use of the new international pictogram of a running man which is growing in use throughout Europe. UK standard BS5499 differs from this and which standard will finally prevail is not clear but the following guidelines should help in consulting the appropriate Fire Authority:

1. Exit signs incorporating pictograms to be used in new buildings.
2. Extensions or replacements to existing systems must have a consistent format (BS5266).

Central battery systems

The Draft Standard details the product requirements and tests necessary to ensure adequate unit system quality and performance. The major points are:

1. Battery quality and performance must be such that it will still meet its required output at the end of its design life.
2. All lead acid batteries must have low voltage disconnection circuits to prevent them at the end of the operational cycle.
3. Charge must be matched to battery and ensure the total system recharges to 90% within 12 hours.
4. Monitors must be more specific and easier to understand for non-technical users.

5. Central inverters must be capable of clearing any distribution fuses and not electronically shutting down without being isolated from any fault.

It must be stressed that the above changes are advance warning of what is likely to occur and although some aspects have a retrospective element to them the current relevant standards in the UK are BS5266, BSEN60.598 and BS5499. Once introduced any new standard called up by legislation is likely to have a period of grace for existing buildings that are caught in a retrospective net.

Although anticipation of these standards may save future disruption to a site, until the provisional standards are confirmed and called up as UK legislation their actual content and application can only be best guesses.

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A range of control

Since its launch a little over a year ago, Hawker Fusegear's ZED range of controllers has been applied to a number of lighting projects.

These include the Walthamstow Stadium where the lights in the spectator areas have to be dimmed as the floodlights on the track are switched on. Originally this was done manually by quickly flicking 20 switches. This is now achieved with just one switch which dims the spectator lights and brings the floods up gradually in a cascade. This arrangement avoids a power surge and the likelihood of MCBs tripping.

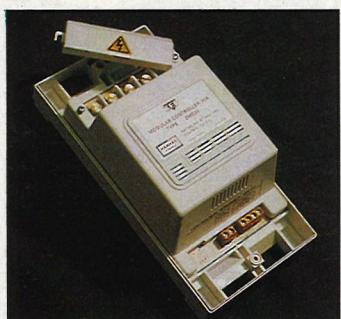
ZED has also been used at the Guildhall University (formerly the City of London Polytechnic) where there are eight floors in regular use during the day and then only irregularly after normal working hours. These are being equipped with a system of 16 time delay controllers (two zones per floor) linked back to the Keepers' lodge. During the working day control of the lighting is exercised by the Keepers. This then switches to local control with a time delay for other times of the day. At a total cost of about £800 for the controllers a quick payback is expected.

One application where a fast payback has already been calculated is at the garage of the London Mews Hilton. The garage has 12 fluorescent fittings and these used to be on all the time. They are now controlled on a time delay using one ZED controller, giving a payback of 30 days.

The ZED controller was launched a little over a year ago to provide intelligent control of

electrical circuits. The design has been kept as simple as possible, with the use of 12V on the switching side to provide ease of installation and to reduce cabling costs. ZED products act as intelligent junction boxes and can be built into dedicated systems employing as many modules as required. In addition to the basic switching functions, they can also be used for dimming with tungsten or low voltage dichroic lamps.

Hawker has now introduced three new products to the range. These include the ZED Master Modular Dimmer (ZMMD), the ZED Modular Slave Dimmer (ZMSD) and the ZED Modular PIR Controller.



The ZMMD provides multi-point variable dimming control, programmable pre-set levels and multiple load control. Lights can be set to come on at similar or totally different levels by interlinking the controllers.

ZMMD will handle up to 500W but the load can be increased by the use of a slave unit, the ZMSD. These can each control loads of up to 2.5kW and can be interconnected to further increase load handling capacity.

The ZED Modular PIR Controller can be used with one or more PIR sensors to switch on a load (usually a light) in areas where movement is detected. It can handle power loads up to 10A and 30A and can be provided with a time delay anywhere between 30 seconds and 20 minutes. By linking ZED units the PIR can be set to be on all of the time while other lights on the same system are on and then to operate as a PIR when the other lights have been switched off.

Reader Service No 190

Microlights for McDonalds

When McDonalds was experiencing reliability problems with its low voltage fittings it was recommended, by lighting maintenance company Parkersell, to install Microlights low voltage luminaires and transformers. This recommendation was accepted and, initially, five central London sites were re-fitted.

As a consequence, when McDonalds introduced its 'Euro 195' concept of using pre-fabricated pods for new restaurants the company invited Microlights to supply low voltage and compact fluorescent fittings. Three of these new sites have so far been completed, using low voltage RMD1 downlights with GE Twist & Lock lamps and self-regulating transformers. Also, the Pharos compact fluorescent fitting was used in preference to the standard 600mm square fitting. According to Microlights, the Pharos was chosen because it offers reduced energy and maintenance costs, ease of installation, even light distribution and is aesthetically pleasing.

Reader Service No 191

ILP - THE HALLMARK OF TRANSFORMER TECHNOLOGY...

Maintenance-free, electronic and standard SELV lighting transformers from ILP, the name for Innovative Lighting Products.

ILP products are marketed throughout the world and manufactured to the highest specification based on advanced computer aided design technology. Easy to install and fully dimmable with conforming dimmers, ILP.

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MF Range: fully maintenance free operation.



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Lighting the way to savings

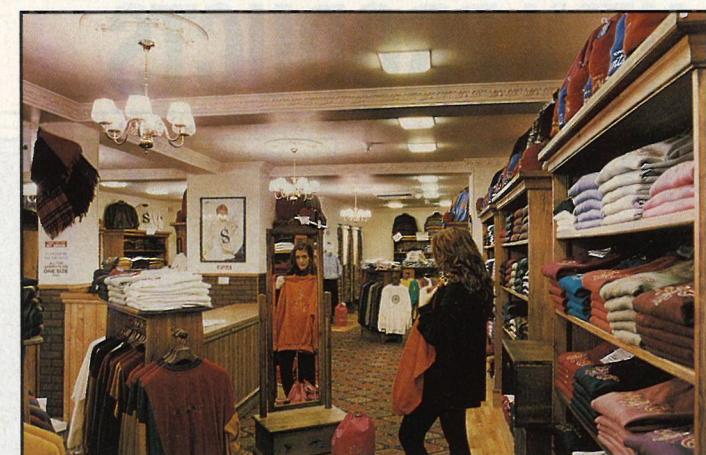
It is common to pay lip service to energy efficiency but it is not so common to calculate the actual savings that can be achieved. The Department of Employment in Sheffield, for example, stands to save around £200,000 by the end of the decade, simply by upgrading its lighting. In this case, the reduced energy consumption also saved on the installation of a new substation transformer to cope with increased demands from computers, giving a further saving of £450,000.

At the other end of the scale, an office building in Harrow is saving £1000 a year from just two floors.

All over the country, offices are commonly operating under luminaires that were installed 5, 10 or even 15 years ago, long before the availability of the energy efficient technology we have become familiar with today. The culprits are not only the speculative developments that traditionally opted for the cheapest lighting. Even high specification installations have been overtaken by the march of time and many are paying a huge price.

Alongside these potential cost savings is the pressing need to provide for the seven million or so people who now work on VDUs. So as well as wasting energy, much office lighting will not comply with either LG3 or EC requirements for VDU areas. The effectiveness of retrofit in upgrading the lighting to achieve both savings and comfort can be seen from some recent examples.

When the Crown Prosecution Service moved into King's House, Harrow over 600 air handling luminaires were upgraded without having to be taken out of the ceiling. The existing flat, prismatic diffusers were replaced with 16-cell, LG3 Category 2 louvres to provide the lighting control necessary for VDU working. The SRS gear was replaced with



White 38W Giotto Mayor semi-recessed ceiling fittings from Lumiance are being used in branches of Sweater Shop.

Reader Service No. 192

high frequency electronic gear, pre-wired to merely plug into the existing mains connections. Project designer Noreast Building Management, confirms that this kept the contract period short and cut the overall cost by a further 18%.

The luminaires now accommodate twin, 36W CF lamps instead of twin 40W 'U' tubes. This arrangement provides the flicker-free lighting necessary for the VDU users, as well as saving £1000 a year on energy.

Similarly, at Citibank's offices in Lewisham, the six year old continuous lighting was upgraded

with VDU louvres and new control gear without altering the continuous trough or the ceiling. Immediate savings were made by changing from 125W to 70W lamps, with the added benefit of reducing maintenance costs.

The opportunity to provide VDU lighting and reduce energy costs at the same time is increasingly available to all companies. RADA Lighting, for example, offers a lighting audit as a free service to help organisations take the first step towards bringing their lighting up to the required 1990s standards.

Reader Service No 192

Genesis lighting at Sheridan

Working with Four IV Design Consultants, Genesis Lighting has developed and manufactured a number of special light fittings for the Sheridan's concession at Allders, Croydon. Seven 3.4m long lighting bars, each with six spotlights sited along their lengths, were finished in metallic bronze and brushed aluminium.

The 50W low voltage fittings housed dichroic lamps and were operated from remote transformers. These fittings illuminate the various display cabinets and are said to be ideal for lighting the colourful fabric designs. Fluores-



Sheridan at Allders

cent light boxes to the top of the display systems back-light the high level model displays and infill was provided with low voltage recessed directional fittings.

Reader Service No 193

way and a full-scale trial confirmed that the previous lighting level was maintained over the full area served by the mast. Silverlight was then authorised to modify lamps from the other 31 masts.

Electricity savings are now nearly £50,000 a year for floodlighting, for an investment of £97,000, giving a payback period of two years. Re-lamping costs are also reduced, as there are only half as many fluorescent lamps to replace inside the terminal building and the smaller lamps are cheaper than the ones they replaced. The new lamps also have extended lives, requiring replacement only every two and a half years now, compared to every year previously.

Reader Service No 194

Halving the cost of floods

The Dover Harbour Board is said to be saving nearly £50,000 a year in electricity costs for the Dover Eastern Docks site, following work by Silverlight to increase the efficiency of floodlighting. Further savings are also being made on lamp replacement costs and maintenance.

All 327 of the old 1000W lamps used on the site have been replaced with 600W lamps and new internal reflectors which direct the light more effectively than was previously the case. This allows smaller lamps to provide the same illumination level as previously, but at lower cost. The old 250W ballasts for each lamp have also been replaced, with 50W versions. The package of new lamps, reflectors and ballasts has cut the electrical loading at each lamp from 1250 to 650W, while maintaining the required illumination at ground level of 50 lux.

Silverlight was invited to mod-

ify the floodlighting after completing a programme to reduce lighting energy consumption at the main passenger terminal. At this site the same principle; smaller or fewer lamps, high performance reflectors and more efficient ballasts, were used on the interior lighting. More than 500 twin-tube fluorescent fittings were replaced by single tubes with new reflectors and high frequency ballasts. As a result, electricity costs for the building were cut by nearly £20,000 a year for an investment of £48,000, giving a payback period of 2.4 years.

Following this work at the passenger terminal, one of the site's 24-lamp floodlighting masts was selected for trial to see if the same reflector technology could be extended to exterior lighting.

Silverlight took samples of the SON-T lamps and luminaires to its workshop, where it designed and manufactured a faceted reflector from high specular aluminium. It also replaced the ballast with a lighter and more efficient version.

Each of the lamps from the trial mast was modified in this

Watching the bills

When the likely energy consumption of a building is estimated, the lighting is often overlooked. This was not the case, however, at the Vintners Place development in London. Alpa Lighting, which won the lighting contract, has supplied over 4,500 recessed luminaires equipped with Pulsestarter and Wattwatcher ballasts from Arlen Electronics.

According to Arlen, use of Pulsestarter for this installation has doubled lamp life while Wattwatcher has reduced the lighting load to 60kW compared to standard systems. A further advantage of Pulsestarter is that it does not need replacing when relamping, thus reducing waste.

Reader Service No 195



Global Technology at the NEC

Electrex (Halls 4 & 5)

established for over 40 years, is Britain's foremost electrical exhibition covering Instrumentation and Control Systems, Generators and Motors, Lighting, Installation Products and Services.

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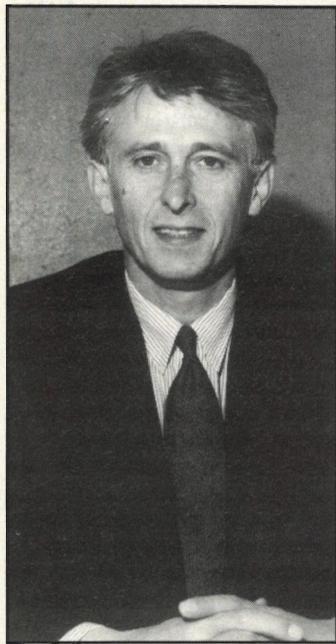
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NEC Birmingham UK



PREACHING TO THE CONVI

Kevin Potterton, Managing Director, of Croydon based Coolite Limited explains how the future of lighting control

"*The coolest running, most energy efficient fluorescent lighting system available." This is quite a claim, so naturally we have asked Coolite to tell us more about the fluorescent control system that although only launched in January now has in excess of 30,000 units operating in the field.*

Croydon based Coolite was formed in 1989 and today the company employs 14 people nine of which are involved in design and CAD work. The company specialise in hot and cold cathode lighting manufactured to BS 5750 and 4533. The control gear, which has been 3 years in the development, has many applications and advantages over existing fluorescent controls.

"The entire ethos of this company is to identify, liaise and solve the problems of many end-users and consultancy services face in the day lighting of their stores, I guess, this is how the product developed, by simply talking and acting on the needs of our customers. When you consider some of our clients use 1,500 undershelf luminaires on a single installation and the problems they experienced in the past with heat build up from both the lamps and running gear with conventional systems, they are now finding the Coolite system not only ensures longer shelf life for perishable/heat sensitive products but the ambient temperature in those areas is greatly reduced so creating a more pleasant environment for both customer and staff."

Light levels

"One way to reduce the heat is to reduce the lamp wattage, this results in confusion from shoppers with labelling, transversally too much light-out level causes the product labels to blur. Our project, became increasingly clear, we had to find a way of reducing the heat omissions from the lamps and gear without reducing the lux level required."

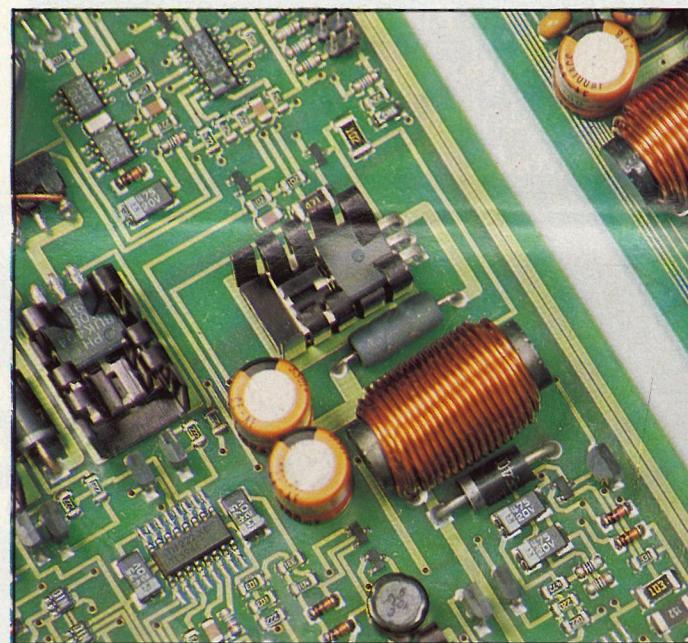
Fluorescent lamp

"The lamp is one area which will give off heat in any conventional fluorescent lighting system. The Coolite system offers a significantly reduced lamp operating temperature compared to any equivalent system on the market. By utilising a high frequency drive system increases the tube efficiency over the standard 50Hz main system, in addition the tube arch is driven with slightly reduced power which contributes further to a lamp reduction in lamp temperature whilst having no significant effect on perceived

light output. This had to be achieved whilst having no detrimental effect on lamp life and with none of these advantages being contributed to the fluorescent lamp, thus leaving the end users a choice of any 4 pin lamp regardless of manufacture or colour rendition.

ered as a new generation of ballasts.

We call it a second generation ballast because with most conventional 50Hz magnetic ballast systems which draw current and then employ a current reducing factor hence a substantial amount of the total power consumed by the



As an example, the temperature measured at the tube surface adjacent to the internal electrode of a 36W 4'26mm lamp was 27 degrees C lower on the Coolite System than the same lamp operated on an equivalent 50Hz mains fitting.

"The vast majority of the company's profits are returned straight back to the company for development and product innovation, we have some very exciting plans coming up for the future and even by the autumn we should have a 240V system on the market."

The Coolite system is slim, unobtrusive and well engineered - BIP plastic ends is a feature of all our systems yet it is not required in this country until 1996, all our products are sent to BSI for evaluation."

The Fluorescent Driver Unit

"The second area of heat in any system is ballast, at Coolite our product is referred to as the Fluorescent Driver Unit, because the product whilst incorporating state of the art, but reliable components is what can only be consid-

ered as a new generation of ballasts.

We call it a second generation ballast because with most conventional 50Hz magnetic ballast systems which draw current and then employ a current reducing factor hence a substantial amount of the total power consumed by the

Energy

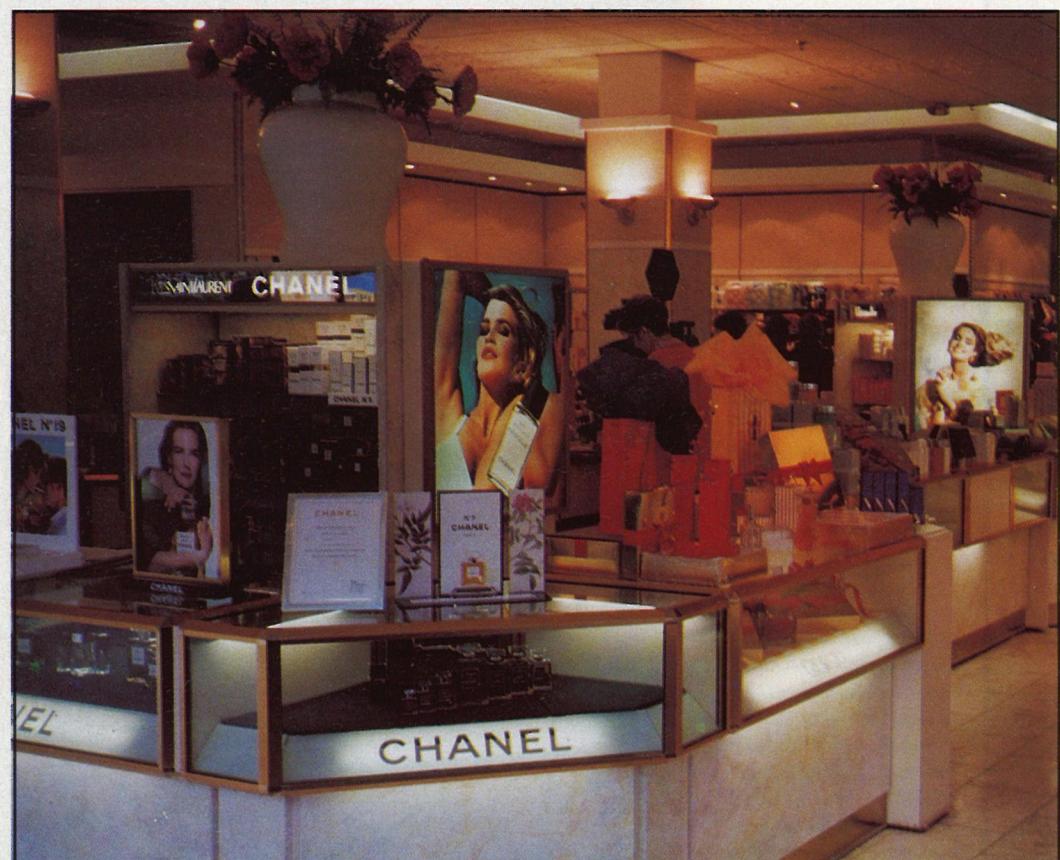
"The idea that electricity is not getting any cheaper and rumours of significant increases to industry in the future, was behind one of our design goals. To make our product as energy efficient as possible, the result of which is that our fluorescent drive unit is 80 - 84% driver efficient. Many stores have advised us of other energy savings, reduced heat from the lamps and gear, the air conditioning system can be run at a reduced level."

Refrigeration

Mark Potterton, Technical Sales Manager, talks us through some of the advantages of the Coolite



The Coolite system installed as over canopy lighting



A Health & Beauty installation may involve 1,500 lamps, the Coolite system will significantly reduce heat on this typical installation

ERTED

is all in the chip.



"Our entire ethos is to identify, liaise and solve problems that many end-users and consultants come across when lighting their stores."

that with the increased heat from conventional systems, the freezer is forced to work harder, hence increasing power consumption. This has resulted in many stores removing their freezer lighting altogether and relying on the isle lighting to illuminate the dark recesses. As we have achieved both heat

reduction in the lamp and gear our system allows the freezer to work more efficiently and chill down to the EEC recommended -2 at the core."

"The third problem that we had to overcome was softly striking the lamp and getting it up to its optimum output at reduced temperatures. The Coolite system can strike at -20 but its normal working range is down to -6 and the lamps are in their optimum range within 20 minutes."

Self Intelligence

The fluorescent drive unit has a built in fault detection system which incorporates the use of a restrike, should a lamp fail during normal operation, it ensures that the lamp is restrike several times. If the lamp cannot be restrike the system will shut down after 25 second, removing voltage from the lamp terminal and stopping annoying lamp flashing due to a failed lamp."

"The second problem when illustrating a freezer display is



A multi undershelf lighting system in a refrigeration cabinet producing good colour rendering.



Tesco Stores



CWS



Stewarts

- Undershelf Lighting
- Health & Beauty Displays
- Pharmacy Counters
- Cosmetic Counters
- Refrigerated Cabinets
- Fresh Produce Displays
- Point of Sale Displays
- General Display Lighting
- Backlit Signage
- Walkway Lighting
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Steady progress

*Richard Holness reviews the most recent developments of the high pressure sodium lamp. From its beginnings in the 60s, he explains why the lamp is now a far more influential factor in many aspects of commercial and industrial lighting.

The high pressure sodium lamp (abbreviated to HPS or SON) was introduced and welcomed in the 60s for its greater luminous efficacy compared with the then well established mercury discharge lamp, and its golden white colour, which represented a vast improvement on the low pressure sodium lamp.

This new lamp source certainly opened up opportunities for specifiers and fittings manufacturers to answer some of the criticisms of SOX for outdoor applications. The colour characteristics were not of a sufficiently high level, however, to displace existing methods of lighting indoor spaces and if the product was specified, it would be in conjunction with white sources such as mercury and, subsequently, metal halide.

That however is history. Although metal halides have become more reliable and efficient, the range of HPS lamps has been greatly expanded, particularly over the past decade, so that they can now handle the full gamut of interior and exterior applications. Over the past five years a new range of 'Super HPS' lamps have been launched based on the raising of the Xenon starting gas by a factor of ten. This has led to a dramatic increase in life expectancy and lumen output. Colour improved types had already been developed, although at the expense of lumen output. The latest development in this range has been the 'White' SON.

The development of new HPS lamp types will be directed towards unsaturated as opposed

around 115 lumens per watt for a 250W lamp. These characteristics have limited the use of standard types to mainly outdoor applications, such as perimeter fencing, car park lighting or general amenity illumination.

Their performance indoors, for instance in industrial or warehousing situations, requires careful consideration and calculation from both a comfort and functional point of view. A judicious mixing of standard SON with white sources such as metal halide or mercury, or even fluorescent, might provide an acceptable solution. But this is where a glance through the most recent HPS product catalogue will pay real dividends. The remainder of the article provides some background to what you will find.

High colour rendering

In the past decade extensive research and work has been directed at the development of colour improved HPS lamps. As a result, the application range of these lamp types has been dramatically extended to include industrial and commercial interior schemes. Increasing the sodium pressure has the effect of broadening the spectrum of an HPS lamp over the whole visible region resulting in improved colour characteristics.

The result has been the introduction of an HPS lamp in the 35W-400W range with a colour rendering index of RA=60, a correlated colour temperature of 2200K producing between 53-90 lumens per watt.

With this improved colour rendering at low colour temperature

outer jacket instead of the conventional vacuum jacket. The cooling effect of the gas on the PCA wall allows a higher wall loading at the same wall temperature, resulting in a significant luminance gain.

For the White HPS, electronic stabilisation is needed to minimise colour temperature, system-to-system variation and colour



High pressure sodium lamps can be used in a variety of applications to meet the lighting requirements of the occupants.

shift over life. However despite these developments the combined effects of manufacturing tolerances and environmental factors such as ballast impedance, input voltage and fixture effects cause colour spreads which are often too high to be acceptable to most observers.

The colour temperature and CRI of an HPS lamp can also be increased by operating the lamp with a pulsed current. This yields an RA of 70, CCT of 2800K, producing 55 lumens per watt. Within its relatively high colour temperature the lamp is primarily intended for display and other indoor applications.

Super HPS with increased xenon

Since its launch five years ago, the Super HPS has achieved considerable acceptance. Manufacturers of this source have as a result

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fluorescent tubes to accurately recapture natural sunlight thanks to a small additional component of UV light.

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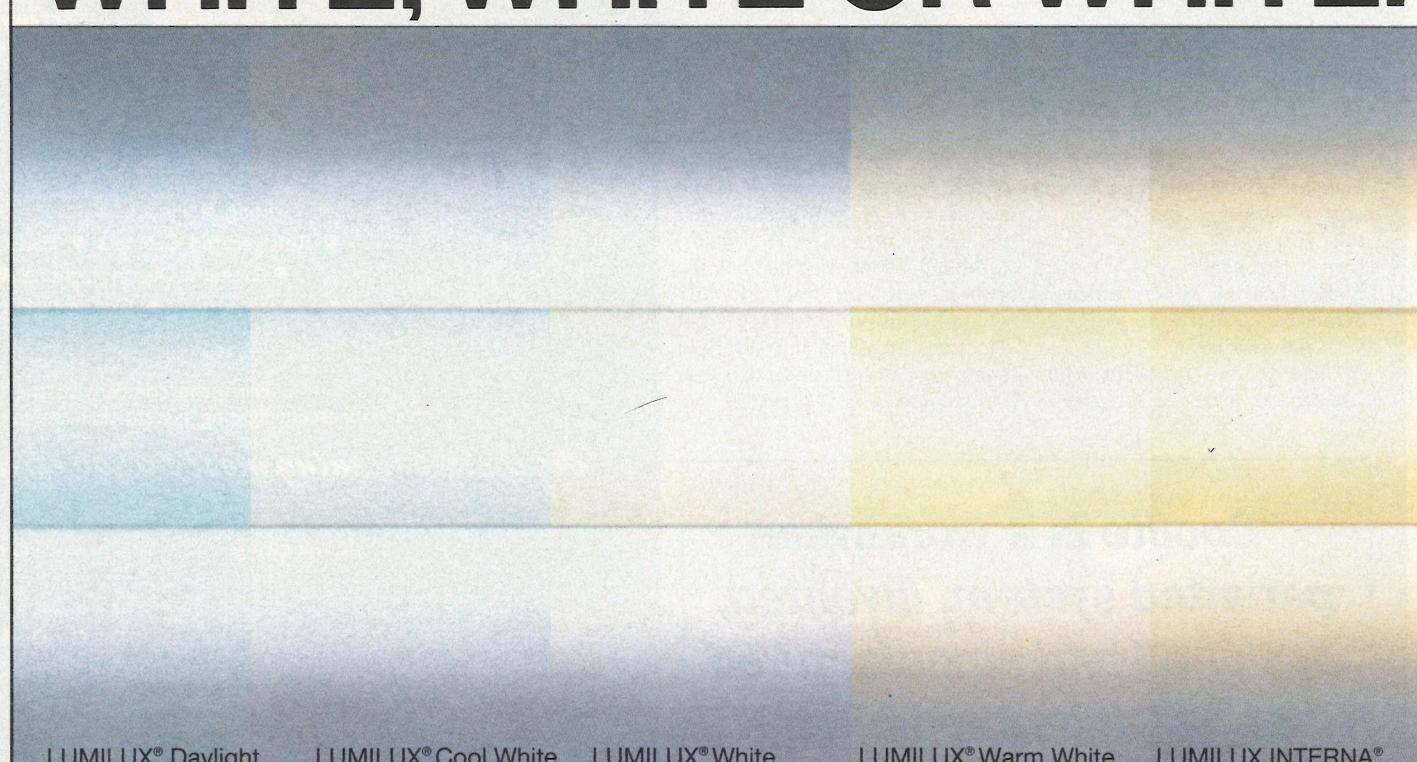
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FLUORA tubes are the ideal solution wherever plants do not receive enough natural daylight. By stressing the blue and red parts of the light spectrum, they not only show flora in offices, aquaria, shopping arcades and greenhouses in their best light, but actually promote the process of photosynthesis.

ReaderService No.20

ReaderService No.21

LIGHT CAN BE WHITE, WHITE, WHITE OR WHITE:



LUMILUX® Daylight

LUMILUX® Cool White

LUMILUX® White

LUMILUX® Warm White

LUMILUX® INTERNA®

Fig. 1. Survival rate of standard (33mbar xenon) and Super (225mbar xenon) commercial 70W HPS lamps.

to saturated sodium vapour lamps. The former have the advantages of not 'cycling' at the end of life. Also available will be mercury-free lamps which satisfy environmental concerns about the disposal of heavy metals.

The result of all these developments is a family of lamps that can perform far more tasks with greater efficiency, safety and comfort. The onus is on the designer to appreciate the choice now available, and select the HPS lamp on its specific merits. The following review will, I hope, assist this process.

Standard

Initial development efforts following the introduction of the first HPS lamps were directed towards improving lamp efficacy. Standard HPS lamps now have a colour rendering index of RA 18-25, a correlated colour temperature of 1900-2050K and produce

and fairly high efficacies, these lamps can be used for outdoor applications such as car parks where a better colour rendering - for security and location purposes - is required. They also suit indoor locations such as warehouses where a good luminous efficacy is more important than high quality colour.

White HPS

A second type of high pressure sodium lamp, often referred to as White HPS, was developed for high quality indoor lighting. This gives a colour rendering of 35W-100W lamps of RA=85, a CCT of 2500-2700K, producing between 40-50 lumens per watt, and can be used as a replacement for incandescent.

The colour temperature of these newly developed White HPS lamps was raised from 2500K to 2700K whilst retaining the CRI at 85 by utilising a nitrogen filled

replaced the tubular clear bulb standard types with this new high xenon pressure version in the lower wattage range (up to 150W).

Super HPS, where the Xenon starting gas has been raised by a factor of up to 10, have higher luminous efficacies (up by 7 to 15% depending on the wattage) and longer lives (1.5 to 2 times the life of the standard lamp).

The life expectancy of HPS lamps increase dramatically with the addition of xenon. Figure One compares the survival rate of a standard 70W HPS with low xenon pressure (33mbar) with a Super HPS with 225 mbar of xenon pressure. Average life (50 per cent survival) increases from 13,000 hours to 23,000 hours.

The most important failure mode of HPS lamps is cycling due to high voltage. Hence the increased extinguishing voltage of

high pressure XE lamps allows a longer lamp life.

Moreover, the two main causes of increasing lamp voltage during life are inhibited in lamps with high xenon pressure. The first of these causes is the rise of the temperature of the coldest spot (condensation point) in the arc tube due to emitter loss from the electrodes. The loss of emitter causes the end walls to darken due to emitter deposits and to decreased electrode efficiency forcing the electrodes to function at a higher temperature.

Both effects cause the rise in cold spot temperature. The second cause is the gradual loss of sodium from the arc tube shifting the mercury to sodium ratio upward. The increased mercury pressure causes the lamp voltage to rise.

During start-up, the time needed to make the transition from a glow discharge to a stable

arc mode discharge (ignition time) depends on the starting gas pressure. This can be explained by the fact that the current density for a glow discharge increases with the square of the gas pressure at constant cathode fall.

Thus a higher xenon pressure enhances the power density of the electrodes during the glow phase, causing a more effective heating of the electrodes. Since it is the heavy ion bombardment of the cold cathode during the glow phase that causes sputtering of emitter material and tungsten from the electrodes, the shorter ignition times of high xenon pressure lamps reduce wall blackening and cold spot temperature rise.

It can also be noted that as the increased starting gas pressure reduces emitter evaporation rates through accelerated warm-up, the time needed to build up the final arc tube pressures is minimised.

D-Line width (A)	Tc (k)		Ra		(x, y)	
	75% Hg	Hg-free	75% Hg	Hg-free	75% Hg	Hg-free
100	2050	2150	20	15	(0.535, 0.430)	(0.531, 0.444)
250	2200	2320	60	55	(0.513, 0.422)	(0.512, 0.441)
450	2500	2450	85	80	(0.474, 0.410)	(0.508, 0.444)

Comparison of a HPS design with 75% weight fraction of Hg amalgam and a mercury free lamp design at three D-line reversal widths.

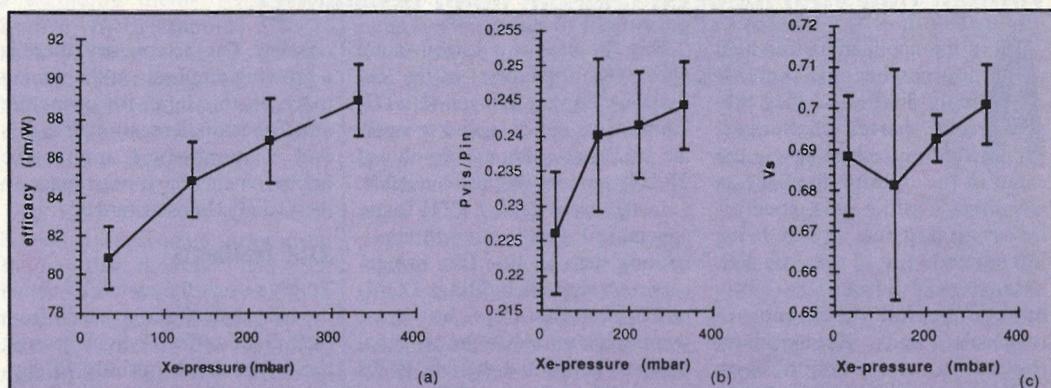


Fig. 2. The efficacy of 70 W HPS lamps as a function of xenon pressure: (a) luminous efficacy, (b) efficiency of the radiated visible power and (c) luminous efficiency of visible radiation.

Finally, since sputtering depends strongly on voltage, the reduced re-ignition voltage of a high pressure xenon lamp is expected to limit the sputtering rate during normal operation.

An enhanced xenon pressure also greatly reduces the loss of metallic sodium from the arc tube. The resulting sodium pressure stability leads to a more stable voltage during life and consequently a longer lamp life.

Besides, at constant arc tube geometry, the lower wall temperature and sodium pressure of the high pressure xenon lamp contribute to this formation rate reduction.

The most significant photometric effect of the rising xenon pressure is the increase in luminous efficacy. The diagram shows that for a set of 70W lamps, the luminous efficacy increased by around 10 per cent from 33mbar to 330mbar of xenon pressure at ambient temperature.

One point must be noted however about starting. The breakdown voltage of HPS lamps exceeds the standardised voltage peak values of igniters at about 100 mbar of xenon pressure. Super HPS lamps therefore require a modern superimposed type of external starter, and therefore they cannot be operated on all circuits.

Unsaturated vapour and mercury free

The first high pressure sodium lamps to be manufactured were saturated sodium vapour lamps which used xenon at low pressure as a starting gas. Later, mercury was added in the form of a Na/Hg amalgam to improve lamp efficacy and colour rendering.

The efficacy increase is due to the reduced thermal conductivity of the sodium/mercury/xenon plasma. Secondly, mercury acts as a buffer gas and decreases the electrical conductivity so that shorter arc tubes can be used for a given lamp voltage.

Thirdly, by tuning the sodium/mercury ratio in the amalgam, the colour point can be positioned on the black-body locus. Since the axis temperature of the plasma is low (+ 4000K) due to the small ionisation potential of Na, the Hg excited states are scarcely populated and the direct radiation of mercury is negligible.

The presence of mercury in HPS lamps causes voltage rise with sodium loss because the voltage of a sodium/mercury plasma increases with rising mercury to sodium fraction. Moreover, the potential environmental hazards of mercury have lead to a call for the introduction of mercury free lamps.

Fortunately, the development of

high xenon technology makes it possible to produce mercury free versions with commercially acceptable efficacy. By replacing the mercury pressure by an equivalent xenon pressure, the thermal conductivity can remain constant.

Efficacy is also increased as xenon has a higher luminous efficiency of visible radiation than mercury.

On the other hand, because the increase of electrical conductivity of sodium/xenon lamps without mercury means that the arc tube must be elongated for use with standard ballasts, there is an accompanying loss of luminous efficacy compared with the standard HPS.

Significant work has also been carried out to find a practicable method of operating the HPS lamp in an unsaturated as opposed to saturated mode. In the unsaturated mode, which is used for high pressure mercury lamps, all the Hg/Na amalgam is vaporised during operation, unlike the standard HPS where only a fraction of the amalgam dose is vaporised.

With unsaturated vapour, a better voltage and power stability is achieved, there is no cycling at the end of life since in unsaturated lamps the arc tube pressures and hence the lamp voltage is limited, cycling cannot occur. This feature is of particular benefit for any relamping programme, such as street or security lighting.

Other benefits of unsaturated HPS are a substantially reduced Hg dose and faster warm-up. However the very low sodium dose (20-100g) makes the lamp extremely vulnerable to sodium loss reactions.

Practical benefits

The HPS lamp has come a long way since its inception. The developments described have implications for virtually all users, specifiers and installers of commercial and industrial lighting, who should make themselves aware of the practical benefits of each lamp in what is now a very complete range.

Some of the efficacy and performance benefits have had to be earned at the expense of other aspects, so you should keep an open mind, and a full notebook, on the many different HPS sources available.

As more developments take place, the goal posts might again be moved.

But you can be assured that future developments will be concerned with improved performance, environmental acceptability and user convenience.

*Richard Holness is product manager at SLI Lighting Ltd.

Reader Service No 224

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OSRAM have launched the definitive reference work for the industry on light sources and electronic control gear. For your copy please circle the reply number.

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A better capsule

*Graham Skeldon examines the latest developments in low voltage tungsten halogen capsule lamp technology.

As the applications for light sources become increasingly diverse, so they present more challenges. Modern technology is the same in the lighting industry as any other – while new, state-of-the-art products are already being introduced onto the market, extensive resources are being applied behind the scenes in research and development towards a new version, with refinements which will address consumer needs and bring market edge.

Of all the numerous developments that have taken place over recent months, one area of particular interest is that of low voltage tungsten halogen capsule lamps.

Tungsten halogen, which is a vital and expanding sector of the light source market, has come a long way since its commercial introduction in the late 1950s. Those original tungsten halogen lamps, designed for mains voltage operation, offered improved luminous efficacy, lasted twice as long as conventional tungsten filament lamps, and thanks to the halogen cycle preventing bulb blacking, maintained 100% light output.

But the real revolution came about with the advent of the low voltage tungsten halogen (LVTH) lamp. Most are designed to operate at 12 volts, although 6 volt and 24 volt versions are also available.

In the early days, LVTH found specialised uses in diverse applications such as cine film projectors and airfield lighting. Luminaire manufacturers, however, were quick to realise the potential of these lamps and the late 1970s saw the first compact fittings that actually took advantage of these small intense light sources to generate high illumination levels, so beneficial for display lighting. And importantly for the user, as LVTH lamps have become more established, so the manufacturing cost has come down.

Another major development was the introduction of the integral LVTH dichroic reflector lamps. This innovation cut heat content in the beam by almost two thirds compared with traditional reflector lamps with a metallised reflector. There is no doubt that integral dichroic reflector lamps have been highly successful.

However, that does not mean that the LVTH capsule lamp is

obsolete. On the contrary, there is a growing emphasis in the market place on this lamp for economic and functional reasons. To this end a number of innovative improvements have been made to the Osram Halostar range.

Axial filaments

To give users the means to obtain the best optical performance from their fixed-reflector light fittings, axial filaments, initially in capsule lamps, have been introduced to complement the existing conventional transverse filament type. Their immediate advantage shows up in their symmetrical light output, which improves reflector efficiency. Beam shapes become more uniform and illumination levels are more even over the lit areas.

Temperature tolerance

One of the problems found with all quartz bulb halogen lamps is that of short life, brought about by failure of the pinch seal. Invariably, this is caused by overheating, and although not necessarily the fault of the lamp, it can result from incorrect application, high ambient temperature, or

from fittings that do not provide sufficient heat dissipation.

Most susceptible are the high current lamps – 75W and above. The established IEC and BS standards covering these types of LVTH lamps recommend that pinch temperatures do not exceed 350°C if early seal failure is to be avoided. But high wattage, combined with onerous operating conditions can easily drive the pinch temperature above this maximum. However, chromatized molybdenum foils have overcome the problem by maintaining the integrity of the pinch seal up to 450°C without the risk of early seal failure.

Reduced ultra-violet

Another problem which has been

associated with halogen lamps is the potential damage caused by their ultra-violet content. Osram Halostar will also now include the UV-Stop range, one of the new products introduced at this year's Hannover Fair.

Featuring special UV-absorbing quartz which virtually eliminates ultra-violet, this is especially useful for lighting applications where sensitive materials need to be lit. Halostar UV-Stop will be particularly welcomed by museums, galleries and retail outlets where valuable antiques or sensitive materials need to be illuminated without the risk of bleaching or the unnecessary acceleration of decay.

By virtually eliminating UVB and UVC, together with halving

the UVA output, these new lamps are the answer for those displays where colour sensitive materials need to be illuminated. Their bleaching effect is only one-third of that compared with conventional LVTH lamps.

No shattering

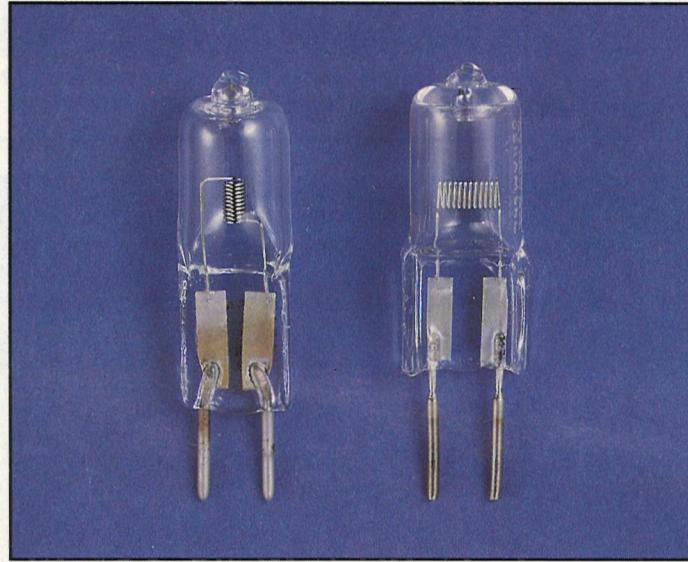
Where lighting designs necessitate simple pin-points of light to create a desired effect, such as 'a canopy of stars', small exposed LVTH capsule lamps are used. But their high operating internal gas pressure poses certain risks with regard to lamp shattering. Proposed new amendments to the IEC luminaire safety standard will recommend the use of safety screens or protective covers for all types of high pressure halogen lamps.

The Halostar Starlite from Osram overcomes this problem. This is a range of LVTH capsule lamps also with absorbing quartz in 5W, 10W and 20W for 12 volt operation (although there will also be a 6 volt 10W version) but designed for an operating internal gas pressures of only one atmosphere.

This eliminates any risk of lamp shattering and meets the proposed requirements of the IEC standard. Lamps lives are still offered at 2000 hours, with lumen outputs reduced by only 15-20% compared to conventional high pressure lamps.

*Graham Skeldon is technical product and training manager at Osram

Reader Service No 225



The Osram Halostar M180 (left) and M28 (right)

Limiting deadly pollution

*Steve Maddox

In the UK we discard about 60 million failed fluorescent tubular lamps every year. Each tube contains about 20 mg of mercury. Thus, in dumping

these lamps, we are disposing of about 1,200 tonnes of mercury annually, as well as substantial quantities of cadmium, lead, copper, tungsten and a variety of other poisonous and polluting metals and minerals.

Mercury is one of the oldest known industrial poisons, and one of the deadliest. It is toxic at very low concentrations, and particularly affects unborn children and babies. Adults having continuous exposure to marginal poisoning with mercury suffer illness which can be fatal. When released into our biosphere, mercury does not degrade, but accumulates – especially in the aquatic food-chain.

Both the Irish Sea and the Great Lakes of Canada are so polluted with mercury that experts advise severe restrictions on the amount of fish from these

waters that it is safe to eat! Mercury released into the environment finds its way into the underground water systems, and soon reappears in our drinking water. The mercury from just one fluorescent tube can pollute 30,000 litres of water beyond currently recognised safe limits.

There is increasing concern about the fact that so few people seem to take much care about the disposal of failed fluorescent tubes. Commonly lamps are broken and put in with other rubbish, or put into skips. Such actions could be the subject of prosecutions, for the disposal of all kinds of lamps is regulated by the *Health and Safety at Work Etc Act 1974 (HASAWA)* which requires that those concerned shall not be at danger from broken glass or of being poisoned by the chemical components of the lamps such as mercury or cadmium.

Whole lamps and the chemicals from crushed lamps should be handled and disposed of as required by the *Regulations for the Control of Substances Hazardous to Health (COSHH)*. The 'Duty of Care' as defined by EC regulations and a recent White Paper makes everyone individually responsible for the correct disposal of their own waste. Lamps, whether whole or crushed, are 'hazardous waste', and may not be included in domestic and commercial waste. Each person who disposes of hazardous waste is required to obtain a receipt to show that the waste will be consigned to a Hazardous Wastes Site which is properly licensed and operated under the *Control of Pollution Act 1974*.

Crushing

In recent years, several companies in the UK have offered devices for crushing lamps and disposing of the chemical contents safely. Two of these have been banned from advertising their products further because the Code of Advertising Practice Committee examined the matter and concluded that these manufacturers' claims that their filters would

remove mercury and other substances from the debris and drenching water from their lamp crushers were spurious. It is clearly established that mercury cannot be removed from liquid effluent by any filter known to be on the market. Nor can the mercury be neutralised, for example by acid, without all the washing water itself having to be treated as poisonous waste.

One UK company that offers a legal and effective means of disposing of fluorescent tubes which does not present a hazard to the operator nor cause pollution is Balcan Engineering Ltd of Woodhall Spa, Lincolnshire, which offers its Type FSL lamp crushers for fluorescent and other lamps. These crushers incorporate a drenching system which prevents the escape of harmful 'aerosols' (microscopic droplets) and dusts down to one micron or smaller which might otherwise be inhaled by the operator to the danger of his health.

Instead of using a debris bin, a 'soakup' bag is fitted. The lamp debris and the drenching water is retained within the bag. All the glass debris and all traces of substances such as mercury, cadmium and lead are completely contained so they can be disposed of legally and safely and without causing any release of pollution.

Another approach

Although there are continuous developments in lighting science, and new types of lightsources come on the market from time to time, it seems highly likely that the ubiquitous fluorescent tubular lamp is going to be with us for many years to come. And, although their life expectancy has increased substantially over the years, there never will be everlasting fluorescent tubular lamps. Because the efficacies (output in lumens per watt) of modern fluorescent lamps are much higher than they were some years ago, it is already possible to achieve required lighting conditions with fewer lamps than formerly.

The most environmentally friendly way of dealing with the

twin problems of how to economise in the consumption of the planet's materials used in lampmaking, and how to limit the potential for pollution in their ultimate disposal, would be simply to make the lamps last as long as possible, so that fewer replacement lamps are required over a period.

This is possible by fitting solid-state-circuitry starter canisters to the luminaires in place of conventional starters. Unlike ordinary starter canisters which last about the life of two lamps, the Pulsestarter from Arlen Electric Group will last the life of the luminaire.

Double life

Fitting Pulsestarter into new fluorescent luminaires, or retrofitting them in existing luminaires, doubles the life

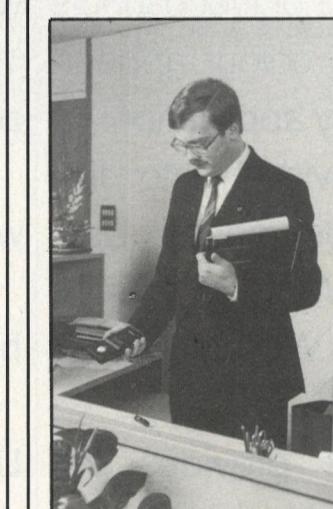
expectancy of the fluorescent lamps, so that the glass, metals, minerals and other finite resources contained within them can be employed longer before it becomes necessary to replace the lamps.

Further, the fewer the number of fluorescent tubes that are used over a period, the smaller will be the amount of energy consumed in the manufacture of lamps. The user is rewarded for his/her environmental act of having installed Pulsestarter by having to buy only half the number of replacement fluorescent tubes that would otherwise be consumed over any period, thereby gaining a substantial economy in the operating cost of the lighting system.

*Steve Maddox is technical manager at Arlen Electronics

Reader Service No 226

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Reader Service No. 9

Lighting Equipment News, June 1993

*Angus Cormie assesses development of the QL lighting system

Inducing a revolution

Over two years ago, in May 1991, Philips Lighting launched the QL induction lighting system. With an operating life of more than 60,000 hours, six times that of gas discharge sources and 60 times that of incandescent lamps, QL has been snapped up by many different end users.

QL is the first lighting system in which the lifetime of the light source is not determined by the lamp itself, but by the electronic control gear. Even after 60,000 hours the light output of the lamp is expected to have depreciated by less than 70% of its initial output.

In addition, the source's high frequency operation ensures that the light produced is non-stroboscopic and completely flicker-free. It is possible to use the lamp in any burning position and it starts almost instantaneously.

The present QL range of semi-recessed, surface mounted or suspended luminaires has been rapidly expanded, both by Philips and independent luminaire manufacturers.

The QL has been selected as the solution for a number of applications, such as high and difficult-to-reach ceilings in offices, hotels, department stores, public buildings and leisure centres – and where lamp replacement causes disturbance to residents, visitors or pedestrians.

One such application is at the headquarters of gas turbine manufacturer John Brown Engineering. The area to be illuminated, a series of stairways located above two floors of offices, is in constant use by employees.

Ian Ritoul of consulting engineers Building Design Partnership (BDP) was invited to recommend a suitable light source that produced a high quality illumination and guaranteed the fewest lamp changes in its service life. Also, because office workers using VDUs would be partly lit by the lamps in the stairways, the light output had to blend in with the illumination from existing fluorescent tubes. After weighing up the various alternatives, BDP selected 15 QL KPH800 suspended fittings and 85W lamps.

"The QL luminaires produce a very even spread of light, leaving no dark spots in the stairs that can jeopardise safety," said a maintenance supervisor with John Brown Engineering.

BDP believes that the QL fittings provide a high degree of light output at around 300-400 lux. The KPH800 fitting has a cover made of acrylic and includes a clear glass inner section equipped with a symmetrical reflector, giving good all-round illumination.

"The QL lamp was only 20% more expensive to buy than its nearest equivalent," said BDP engineer. "But much more importantly, QL will be substantially cheaper over the next eight years. Philips QL is the range of the future for applications where there are space, height and maintenance factors to consider," he added.

In the hi-tech reception area of the Japanese firm of Sanko Gosei at Skelmersdale in Lancashire, four QL 85W lamps have been mounted 6 metres high in an

inaccessible area of the ceiling above the stairs.

If the development of QL in the UK and the rest of Europe is compared, the story closely mirrors that of high frequency lighting in the mid-1980s. But whereas UK specifiers of QL have been of a much greater prestige and size than European installations, the new light source has achieved wider but more mid-market acceptance in Europe.

In Rotterdam, for example, a giant six metre square sign above a new McDonalds motorway restaurant – McDrive – has been lit by dozens of QL lamps. More than 500km to the south, Swiss engineers have fitted QL lamps to the Rudolf Brun bridge in Zurich, a principal road link into the city centre.

Swimming pools are another growing market for the QL. In Tyreso near Stockholm, a total of

48 QL 85W lamps create warm, high-quality illumination for a pool sometimes used 17 hours a day. Pools, especially where children are bathing, are just the kind of end-use where lamp failure must be eliminated whenever possible for safety reasons.

Architectural lighting has been a recurring theme for QL in France. In the famous artists' haunt of Place du Tertre in Paris, old but renovated street fittings have been installed with QL lamps with such success that the system is to be extended into surrounding streets.

In Belgium, new QL-based Solaris fittings, manufactured by Belgian firm Schreder, had been installed as temporary exhibition features for public lighting specifiers at a tourist site in Duruy near Liege. The local authority was so pleased it asked for the lighting to be kept in place.

Recently, Philips launched a new QL 55W lamp to allow luminaire manufacturers to design more compact and lower rating versions of the system.

*Angus Cormie is marketing manager for the Philips QL lamp

Reader Service No 228

Longlife – fact or fiction?

is said to be a far more realistic test of lamp life.

The longer life of the lamp is achieved by redesigning the cathode assembly to reduce emitter loss. The cathode has been surrounded by a non-electrically connected anode screen of iron. The opening on the discharge side is covered by a mica screen with a hole in it to allow this electrical discharge to remain unaltered.

Claims of 20,000+ hours life have been based on a 12 hour switching cycle which reduces emitter loss and extends the life of the lamp. Swedish manufacturer LumaLampan AB has developed a bi-pin fluorescent for which it claims a life of 27,000+ hours.

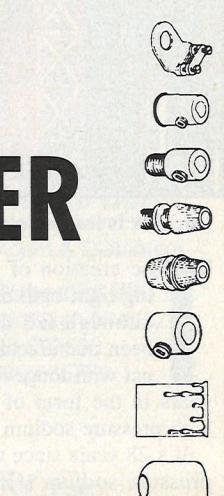
The useful life of the lamp is based on the use of switchstart (SS) or electronic start (ES) control gear and a three hour switching cycle (170 minutes on, 10 minutes off).

The useful life is measured to when % lamp survival x % initial lamp output = 70% of initial. This

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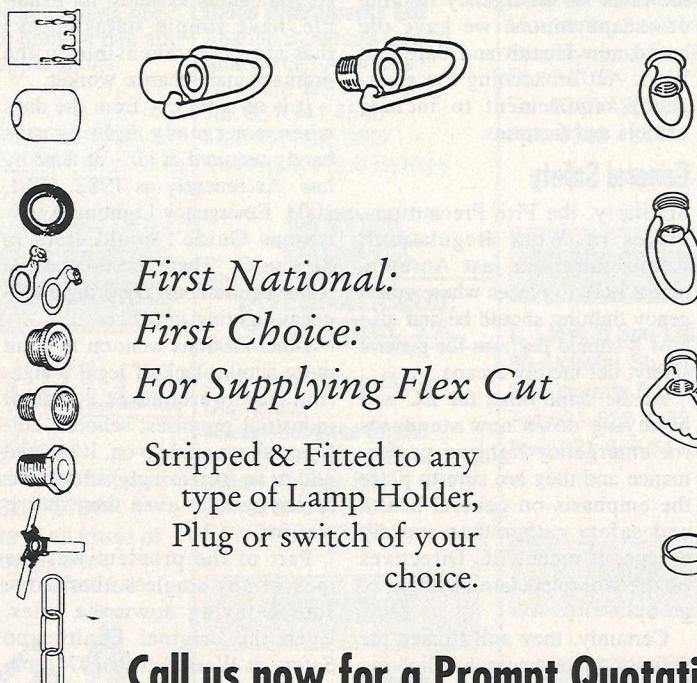
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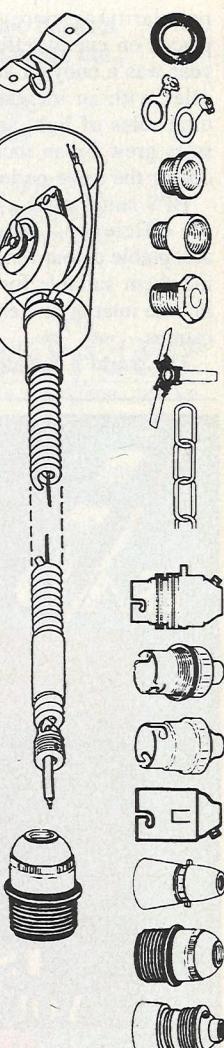
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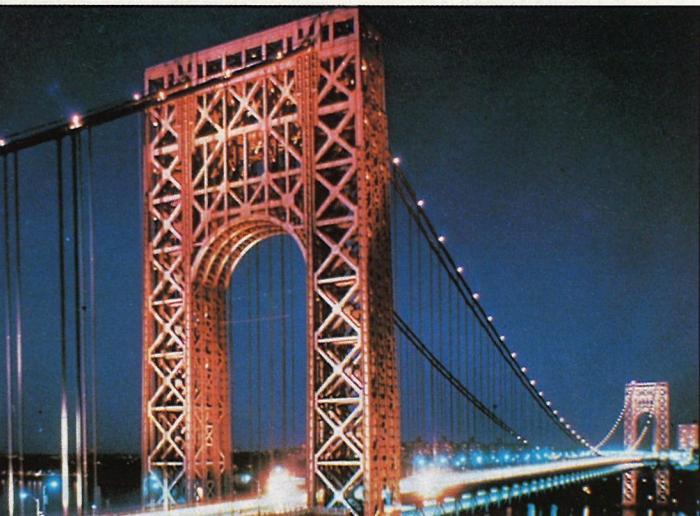
Lighting Equipment News, June 1993

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All SON lamps are high pressure sodium, but not all high pressure sodium lamps are SON. *Harry Siggs looks at the differences

Patently different



Lucalox is less susceptible to blink-out with high vibration

The creation of an everlasting light bulb draws nearer, although GE Lighting has been manufacturing a product with longevity for many years in the form of its Lucalox high pressure sodium lamps.

It's 28 years since the first high pressure sodium (HPS) or SON lamp made its debut on the market and it continues to gain in popularity as more emphasis is placed on energy efficiency. Last year was a buoyant year for lamp sales with an increase of 5% in total sales of light sources. HPS sales grew by an incredible 17% during the same period!

HPS lamps offer a combination of efficiency, long life and acceptable colour rendering, making them suitable for installation in both interior and exterior applications.

The world's leading lamp man-

ufacturers continue to maximise the benefits from ceramic arc-tube technology. Visitors to Hanover Fair will attest to this. The permutations seem to be endless - colour corrected, white light, high output, mercury free and any combination of the same.

HPS lamps provide the best value on maintenance costs. With median life claims of 24,000 hours (or over 6 years in a typical installation) now commonplace, HPS is the nearest thing to the mythical 'everlasting' light bulb available to the lighting engineer working within a budget.

The prime factor limiting life of HPS lamps is voltage rise. There are two principle mechanisms which cause arc-tube voltage to rise through life - sodium loss and lamp operating temperature rise.

The HPS lamp contains, not

pure sodium, but an amalgam of mercury and sodium. The mercury contributes very little in terms of light output, but raises the operating voltage of the lamps so that it can be used with 'normal-type' control gear, rather than the expensive special ballast that would otherwise be required. Unfortunately as lamps age, the mercury component can create problems.

The HPS arc-tube is constructed from a translucent ceramic; the only material capable of containing sodium at the high temperatures achieved. Indeed the concept of a high pressure sodium lamp could only become a reality after GE invented transLUCent Aluminium Oxide (Lucalox for short) in 1962. It is impossible to create a sealed cylinder from one piece of ceramic. In simple terms, a ceramic arc-tube is constructed from a plain tube with an end plug carrying an electrode, sealed into each end using a glass/ceramic sealant.

Individual manufacturers use a variation on this theme. Unfortunately this sealant is not as resistant to sodium as the ceramic material. Through life, sodium will combine with the sealant and is unavailable for further service in the lamp. As a result, the relative mercury concentration in the lamp increases and the lamp voltage rises accordingly.

Eventually the lamp voltage will reach a value at which the ballast voltage will not sustain the arc and the end of life is reached. As a result, most HPS lamps tend to be made with more amalgam than is required for stable operation at the start of life. The excess amalgam is needed to replace the material used up through life by reaction with the sealant.

In many standard HPS lamps the amalgam is located in the main body of the arc-tube. When the lamp is operating it will settle in the coolest part of the arc-tube at the two ends - up against the reactive sealant material.

Temperature rise

The primary cause of temperature rise in the arc-tube through life is arc-tube blackening. Each time an HPS lamp is started some of the tungsten and emission mix from the electrodes sputters off and collects on the arc-tube wall as a black deposit.

The presence of liquid amalgam in the arc-tube ends can interfere with lamp starting and accelerate the end blackening process. This black coating acts as a heat shield, raising the temperature in the lamp, which in turn, raises the arc voltage.

In any HPS lamp in which the sodium/mercury amalgam is carried inside the arc-tube body, the two processes of sodium loss and end blackening will continue inex-

orably from the moment the lamp is first switched on.

Lamp voltage will rise accordingly at a rate of around 2.5 to 6 volts every thousand hours. A lamp will reach the end of its life when it cannot operate stably on the available supply voltage.

Determining lamp life

The definition of 'stable operation' is a matter for some debate. IEC662, the international standard for HPS lamps, specifies minimum lamp voltage levels at which lamps should remain stable. Typically this is around 140V. However, on a 240V supply, lamps will continue to operate at much higher voltage. Extinction is unlikely to occur at much less than 180V.

For a 250W lamp the nominal lamp voltage when operating outside a fitting is 100V. When the lamp is placed in a luminaire the voltage may increase by up to 10V to 110V. Lamp life is calculated by dividing total permissible voltage rise by average voltage rise per 1000 hours. Depending on the definition of end of life, lamp life could be from 10,000 hours [(140-110V)/3V per 1000 hours] to 24,000 hours [(182V-100V)/3V per 1000 hours].

The solution to voltage rise

GE Lighting's lamp engineers, at their research centre at Nela Park, Ohio in the USA have been suc-

cessful in developing a solution to voltage rise and have incorporated the technology in to GE's lamp called Lucalox. In the Lucalox lamp, the amalgam has been removed from within the arc-tube body which automatically reduces voltage rise. The sodium/mercury amalgam is stored in a metal reservoir at one end of the arc-tube. When the lamp is switched on some of the amalgam is vaporised and drawn into the arc-tube, but only a sufficient amount to allow correct operation. There is no excess material in the arc-tube to react with end seals or to interfere with starting.

The result is a dramatic reduction in the rate of voltage rise. Regular testing has shown an increase of just 1.2V each one thousand hours to be typical. Combined with better lumen maintenance this ensures a longer useful lamp life than standard HPS lamps. The external amalgam in Lucalox also makes the lamp less susceptible to blink-out, making it the better choice of lamp for high vibration exposed installations.

Quality lamps will always pay for themselves. When ordering an HPS lamp think about the potential cost savings over the years to come.

*Harry Siggs is product manager of HID lamps at GE Lighting. Reader Service No 230

Legislation to increase emergency sales?

*Paul Dion looks at new and impending regulations that could increase emergency lighting sales.

The obligation to install emergency lighting is growing. It looks set to become more demanding and more widespread - with obvious sales implications for emergency lighting manufacturers.

While escape has always been the focus for the technology and application of emergency lighting this is no longer so. The latest legislation already makes emergency lighting necessary not only in more places but also for reasons other than escape and we can be sure that there is more to come over the next few years.

For example, while the latest Building Regulations harden up the rules for emergency lighting of escape routes, we have the brand new Health and Safety at Work Act broadening the emergency requirement to include schools and factories.

General Safety

Similarly, the Fire Precautions, Places of Work Regulations, which came out last Autumn, points both to places where emergency lighting should be and also how it should perform for general safety, not merely escape.

At the same time, the EC will be laying down new standards for emergency lighting performance and they are sure to place the emphasis on general health and safety rather than merely escape, if recent EC Directives on the workplace are anything to go by.

Certainly, they will tighten the definitions for emergency lighting in high risk areas, typically acid baths and rotating machines, where the emergency supply is likely to be required to provide 10% of the mains lighting illumination, (or 15 lux, whichever is the higher), for about 15 minutes.

Test by law

Just as importantly, we can also expect new directives that could lead to the requirement for all emergency lighting installations to

be tested and maintained by law.

Every emergency lighting manufacturer knows that the amount of repeat business for batteries is negligible, yet batteries have a life of what, four years? What happens when an emergency occurs in year five?

Emergency lighting is typically tested once, on installation, and then forgotten. Some occupiers do not even realise that they have emergency lighting.

Easier

This will stop. Equally, it must be made easier for users to test their systems and we can expect the new legislation to demand that central battery systems, for example, have simple status checks that are comprehensible to the ordinary maintenance worker.

It is all a far cry from the days when emergency lighting was barely required at all - at least by law. As recently as 1982, ICEL 1003 'Emergency Lighting Applications Guide', could state in Section C: 'There are no specific legal requirements covering emergency lighting in offices....'

Other sections went on to point out a similar lack of legal obligation for warehouses, general industrial premises, schools, colleges, shops, and so on. It seemed odd in an increasingly safety conscious society even then, but it was so.

Part of the problem was the lack of any single authoritative source laying down the rules. Even the original Health and Safety at Work Act in 1974 only implied a need for escape lighting in commercial and industrial premises where the safety of employees would be at risk if the normal lighting failed.

Inconceivable

In fact, of course, it was inconceivable that an office block or factory for example, would be built in those days without emergency lighting.

The old GLC in London and

Lancashire County Council in the North tended to see to that and, in any event, the chances of Fire Officer approval were negligible without emergency lighting. But it was an unsatisfactory state of affairs.

Hence, the 1980s saw considerable development in emergency lighting design and applications standards, (through BS 4533 and BS 5266 respectively), and latterly, as we have seen, the focus has switched to make the 1990s the decade when recommendations will perhaps be widened further and given the force of law - they will certainly be tidied up.

In fact, the anticipated EC Regulations, are unlikely to introduce much that is radically new. Their prime function will be to draw together the various strands of national practice into a pan-European standard that will be adopted here with a BS number.

Ironically, too, one of the main new regulations, concerning light output, will not apply in Britain.

Germans have no lux in Britain

The EC Regulations in draft are asking for emergency lighting to provide 1 lux minimum in escape routes and 0.5 lux minimum in open areas - primarily as a result of pressure from the German industry - but we have traditionally opted for 0.2 lux minimum in escape routes and 1 lux in open areas, and this is enshrined in the new Building Regulations.

It means that 0.2 lux will continue to be accepted here as a deviation in standard because of prior law. This is unfortunate for lighting manufacturers, of course, because 1 lux would mean substantially more single point luminaires would be required. And while that might move more business toward central battery systems, there are more stringent requirements on voltage drop that will increase central battery system costs.

So, commercially, this one is a swings and roundabouts situation although, overall, the new rules and regulations should bring a welcome opportunity for the beleaguered lighting industry.

Interestingly, while the German stance on 1 lux is backed by no body of evidence, the British industry requirement is based on scientific research that proves 0.2 lux is perfectly adequate and no one need feel concern that Britain is 'once again lagging behind the rest of the world', as the familiar headlines say.

Sub-circuit protection

The other major Euro change is likely to be an important requirement for sub-circuit protection with each emergency luminaire effectively monitoring the total system so that mains failure in any single fitting will activate all the emergency lighting.

These EC regulations and the recent and impending British legislation are welcome both in clarifying the position and setting new standards for safety. And they should provide a sales boost for emergency lighting manufacturers during the 1990s that was only partly delivered in the 1980s.

In fact, emergency lighting legislation that could have brought much bigger changes ten years ago in the UK was put off by the government, allegedly for reasons of cost to the exchequer - the government is the country's biggest landlord - and indeed the current government is now delaying the implementation of the existing EC Directive on health and safety in the office - but this time they might be too late.

Crown buildings have already lost their Crown immunity and must be equipped with the latest in emergency lighting. So at least one door has opened.

*Paul Dion is electronic systems development manager with RADA Lighting

Reader Service No 231



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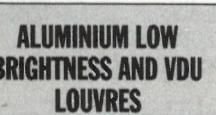
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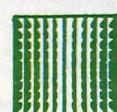
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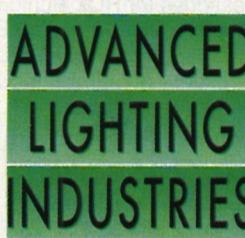
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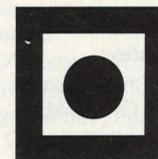
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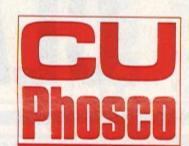


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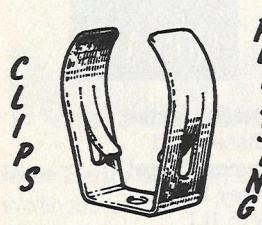
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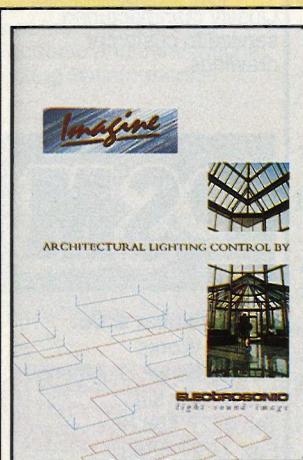


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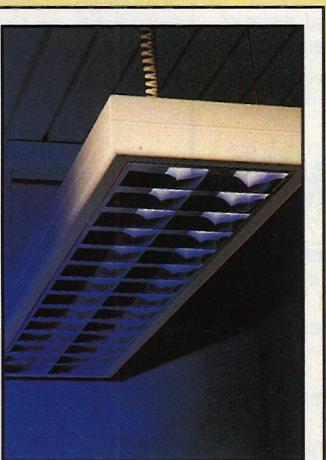
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A new and exciting phase of development now presents the following challenging positions:

■ SOUTHERN AREA MANAGER

We are seeking an experienced and highly motivated Sales Professional age 30-45 with a proven track record in the lighting or electrical industry who is able to manage a sales force calling on electrical wholesalers and specifiers with the commitment to make a significant contribution to the Company's continued success.

■ TECHNICAL SALES REPRESENTATIVE

A Lighting Sales Engineer responsible for promoting our products through electrical wholesalers, contractors and specifiers in the London area. Applicants should have several years selling experience in the lighting industry and be capable of actively negotiating at all levels to maximise sales.

These positions, based at Uxbridge, offer excellent career prospects and generous salary, commission, company car and associated benefits.

Please apply in writing enclosing a CV to:

The Sales Director, ILLUMA LIGHTING LTD.
24-32 Riverside Way, Uxbridge, Middlesex UB8 2YF.

SALES AGENTS

needed for Scotland, North West, South West England, London and Home Counties

Ideal Concepts International, an established Manufacturer and Supplier of commercial lighting in the UK wish to strengthen their Specifier client base. Experienced Agents required to call on Architects, Consultants, Electrical Contractors, and Local Authorities with full technical support available from the Company, plus extremely attractive commission package.

Do not delay! Apply with full details to:

Ideal Concepts Ltd.

Unit 12, Clipstone Brook Industrial Park,
Cherrycourt Way,
Leighton Buzzard, Beds. LU7 8UH
Tel: 0525 853221 Fax: 0525 853224



EXCITING SALES VACANCIES

Lighting Control Sales - Southern UK £19,750

Must have track record selling to specifiers, highly motivated.

Security Product Sales - London and SE £17,950 + Comm

Previous track record system selling via Electrical Contractors and Specifiers.

Tech. Sales Engineer - £Salary + Comm. Structure

1. Bristol and South West
 2. Birmingham, Coventry and West Midlands
 3. Leeds, Sheffield/Doncaster
- All specification sales roles

Tech. Sales Consultant Salary £18,250 - £21,950 + Bonus.

Calling on Architects, Consultants, Specifiers etc. Superb communication skills, must have proven sales track record

Contact Immediately Simon Neil at Morgan Grant on 0734 753535 or send your C.V. to: Orion House, 4 Danehill, Lower Earley, Reading, RG6 4UT

MORGAN GRANT

SALES AGENTS

Emergency Lighting manufacturer requires agents to sell exciting new range of self contained luminaires in defined areas of England, Scotland and Wales.

The successful applicants will have a good knowledge of local Consultants, Contractors, Specifiers and end users.

Please reply in writing to:

Box No. 1556, Lighting Equipment News,
Maclean Hunter House, Chalk Lane, Cockfosters Road
Barnet, Herts EN4 0BU

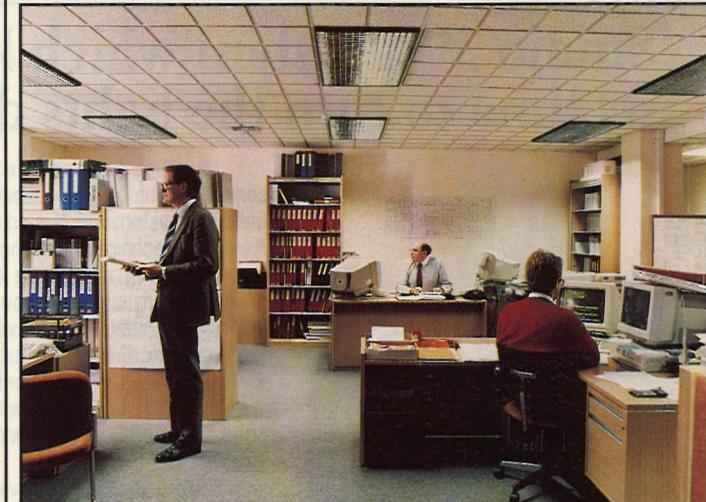
SALES AGENTS

Required to sell emergency lighting and fire alarm products to established contacts in consulting engineers, electrical contractors and wholesalers.

Most areas available.

Written applications please to:

R. M. Wilson - Chief Executive,
Bradley Lomas Electrolok Limited, Manor House,
Church Street, Eckington, Sheffield S31 9SH.



Silver for Angel Court

When Colchester Borough Council was facing lighting problems at its administrative offices in Angel Court, building services manager Ted Phillips contacted Technolight to discuss possible solutions. Much of the building was lit by portable 250W halide uplighters, which created inconsistent lighting with some areas falling below the required level. A further problem was that, because of the use of computers in the offices, the building was subject to the new EC directive relating to VDUs.

Technolight is a supplier of

Courtaulds' Specular Reflector system which uses a coating of real silver, said to increase lighting levels while reducing energy costs. At Angel Court, fluorescent fittings with these reflectors were installed, to provide an even light level of 500 lux on the work plane while avoiding glare on the VDU screens.

"Working conditions for our staff have been greatly improved. And, thanks to the light enhancing effect of the reflectors, we require less tubes and less energy," said Mr Phillips.

Reader Service No 275

In brief...

● The Graylands Trading Company is now exclusive UK agent for Hoffmeister GmbH. The company is intending to move to larger premises in the Reading area shortly.

Reader Service No 276

● Following the closure of the Linolite factory in Malmesbury, the company is now recruiting in the Newhaven area.

all production has been transferred to the Concord Lighting production facility in Newhaven. Both companies are part of the recently formed Sylvania Lighting International and, according to chief executive Norman Scoular, the Linolite products will remain the same, with others to be developed in the near future. The company

Veelite

DISTRIBUTORS/ AGENTS

Is a manufacturer of specification grade, industrial & commercial Luminaires. We require Distributors &/or Agents in several regions, who have contact with Consulting Engineers, Architects & End Users. See Advert (P.13) for address.

ESTABLISHED AGENTS REQUIRED

Southern (Home Counties)

1. Good Wholesale client base essential
2. O.E.M. clients

PRODUCTS, lamps, fittings & collective components. Very marketable. Good commission.

Apply with C.V. in strictest confidence.
Box No. 1559, Lighting Equipment News,
Maclean Hunter House, Chalk Lane,
Cockfosters Road, Barnet, Herts EN4 0BM

Our Fax No:
081-441 1361

lumitron lighting

DESIGNER/DRAUGHTSPERSON
Lumitron Limited – A leading manufacturer of commercial lighting, require a senior fluorescent luminaire designer/draughtsperson responsible directly to the managing director. Experience in thin sheet metal manufacture and knowledge of ceiling systems preferred. Written applications only to:

Managing Director, Lumitron Limited,
Chandos Road, London NW10 6PA

LIGHTING EQUIPMENT NEWS

COPY DATE FOR NEXT ISSUE:

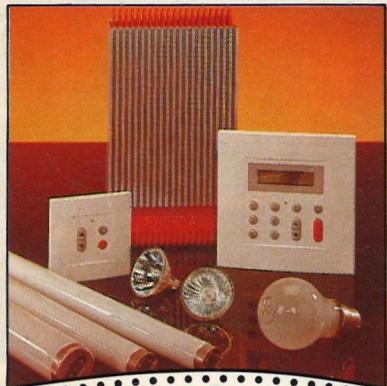
20th JUNE 1993

Phone and reserve your space NOW.

Telephone: 081-975 9759

LIGHTING EQUIPMENT NEWS

'Studio 3' A system which knows when its time to turn the lights down low...



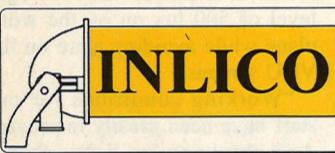
NOW ON DISPLAY AT THE BUILDING CENTRE, 26 STORE ST., LONDON WC1E 7BT.

Home Automation

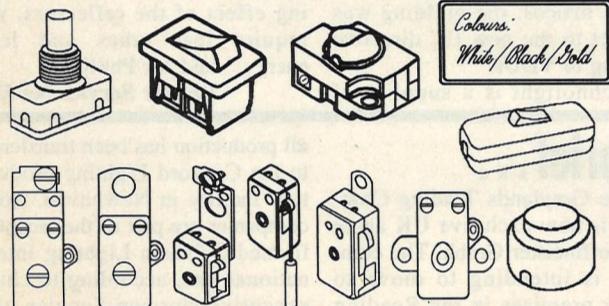
Home Automation Limited, Bumpers Way, Chippenham, Wiltshire SN14 6LF

Tel: 0249 443422 Fax: 0249 443315

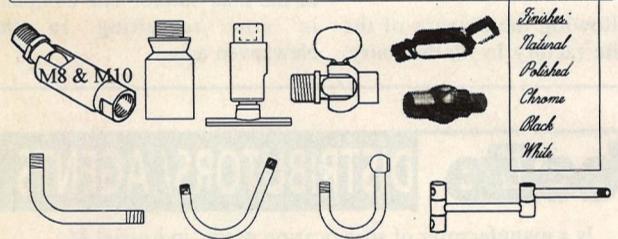
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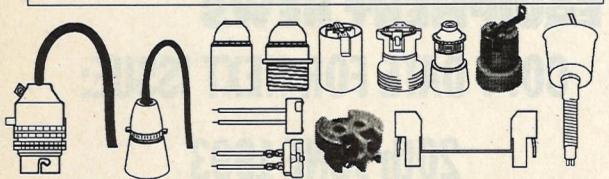
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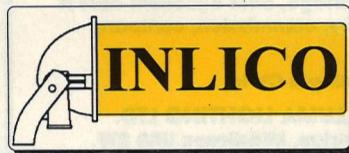
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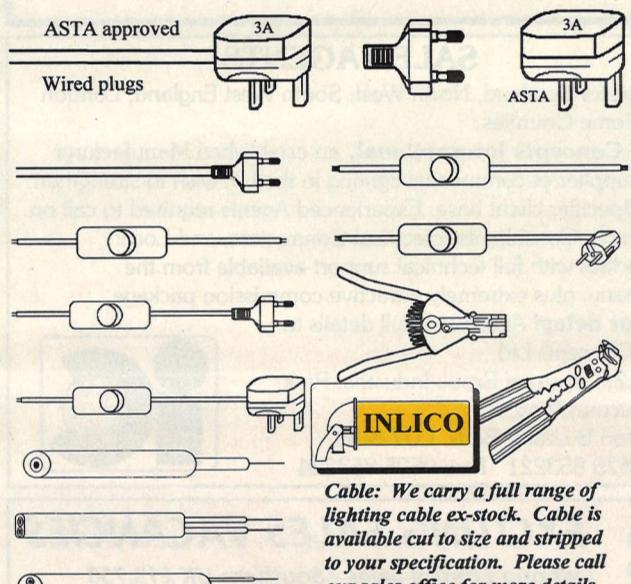
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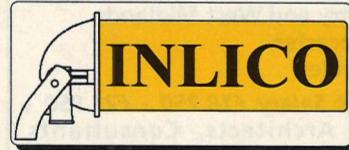


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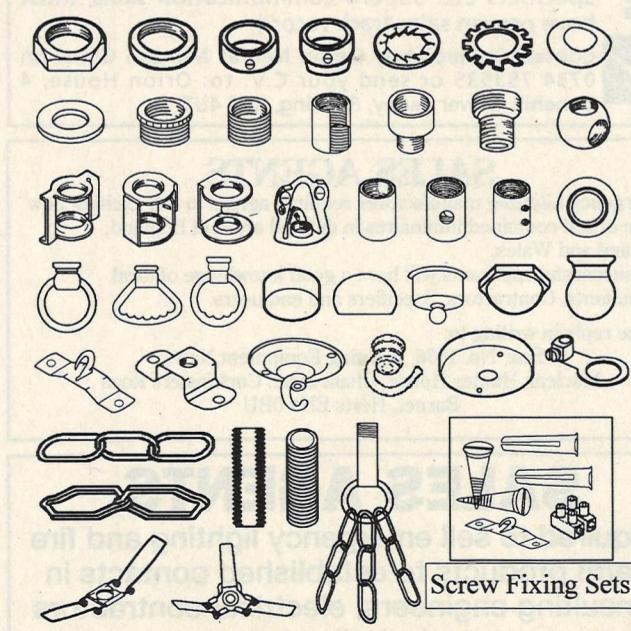


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A Comprehensive Range.
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INLICO Industrial Lighting Components Ltd.
(Manufacturers, Importers & Distributors)

Unit 1, 5-7 South Road, Hockley, Birmingham B18 5LT.
Tel: 021 554 6439 Fax: 021 554 3857

HSE clears up any electrical confusion

The Health and Safety Executive (HSE) issued a warning to those responsible for workplaces not to be misled into doing unnecessary work in order to comply with the law on maintenance of electrical equipment.

Roderick Allison, the HSE's director of safety policy, said that there was some confusion about what people have to do to achieve compliance - some employers have been led to believe that there are "stringent, pettifogging rules" and that compliance entails hiring expensive help.

"To clarify, the law says that

you must maintain electrical equipment used at work so that it stays safe," he said.

"This means that you need to arrange some form of checking by a competent person. It does not mean that every six months you have to buy in outside expertise to inspect, test and label every single item of electrical equipment - from plugs upwards - and keep an encyclopaedic record of results," he explained.

Copies of the Electricity at Work Regulations 1989, SI 1989 No. 635, ISBN 0 11 096635 X, are available from the HMSO or booksellers.

LIGS at Denham

H Black and T Decourcy took first prize in a Greensomes competition organised by the Lighting Industry Golf Society at Denham Golf club. Runners up were J Butler and W Wilson and prizes for the competition were donated by Trevor Oram of OLC/Guzzini.

D Bonnie, N Tavare and B Watts took first, second and third places respectively in a singles competition, to win prizes donated by A Keep of Existalite.

Leading light

Betty Boothroyd MP, Speaker of the House of Commons, was presented with the 'Leading Light Award' by the British Parliamentary Lighting Group. It marks her outstanding contribution to better lighting.

Award winning lighting design

Students Louise Williams, Darryl Scriven and Andy Williams have won Thorn Lighting's first lighting design competition for undergraduates. They received a cheque for £750 for their design of a range of decorative light fittings for a hotel bedroom.

The competition was organised in collaboration with the University of Central England (UCE) in Birmingham and the Copthorne Hotel. The design was based on a brief from Thorn's lighting designers and a specification for

the interior from the Birmingham Copthorne Hotel.

The aim of the competition is to enhance an awareness of the importance of the appearance and the effect of light fittings in hotel rooms, and it will be opened up to undergraduates on a national basis in 1994 and Europe in 1995.

Judges for the 1993 competition were from UCE, Thorn, the Birmingham Copthorne Hotel and Ransley Associates - interior design consultant to the Copthorne Hotel chain.



Simon lights for Cranfield

Simon-Parmenko has been awarded contracts for the supply and installation of lighting equipment at Cranfield Aerodrome. Lighting systems at the airfield are to be upgraded to bring visual aids at the site up to the full CAT 1 standard.

The aerodrome is part of the Cranfield Institute of Technology and is used for pilot training as

well as providing research facilities in its College of Aeronautics. Simon-Parmenko, the specialist visual aids engineering company within Simon Aviation, began work at the site in November 1992, undertaking a complete rewiring operation. The company is also to supply isolating transformers and constant current regulators and a CAT 1 compliant mimic control panel. New luminaires will be installed in the approach system, thresholds and runway edge.

Reader Service No 280

IN YOUR NEXT ISSUE

In addition to the usual array of news, products and case studies, the July issue will be taking a detailed look at Lighting for

Sports, covering stadia, leisure centres and anywhere else where sporty types like to see what they're doing.