

# LIGHTING

## EQUIPMENT NEWS

JUNE 1991

### Thorn factory to close

Plans are being made to close Thorn Lighting's factory at Merthyr Tydfil following a decision by GE Thorn Lamps to alternatively source incandescent lamps and filaments currently manufactured there. The South Wales plant employs 506 people.

Production is scheduled to be phased out over the next 12 months. This will give employees time to plan for their futures, will provide for an orderly close down of manufacturing operations, and will allow GE Thorn Lamps to make alternative arrangements to satisfy customer needs.

Commented Steve Hayes, Merthyr Tydfil factory manager, "The problem is that the plant has been unable to generate the economies of scale required in an ever increasing cost competitive global marketplace."

### Wiring regs to become national standard

The Institution of Electrical Engineers and the British Standards Institution have been looking at the possibility of formally recognising the wiring regulations as the UK national standard for electrical installations.

The IEE has undertaken the publication of the regulations for over one hundred years now and they have effectively become the UK national standard. With the impending creation of the single European market it is felt that recognition would enhance the standing of the document. The discussions have generally been supported by the electrical trade.

It was impossible to reach an agreement in time for the publication of the sixteenth edition, but arrangements should be in place in time for its implementation in the first amendments to this edition, scheduled for early 1992.

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## Centre of excellence

To mark its centenary, Philips Lighting in Eindhoven has opened a new, just under £5 m illion, demonstration centre for professional products and systems: the

Lighting Application Centre. The 3300 square metres of floorspace offer an opportunity to experience examples of modern lighting technology in real-life situations. The

entire installation comprises 2620 luminaires – and a total length of 96.5km of cabling.

The centre is intended to inform the lighting market about the application of new products to publicise Philips as a developer and supplier of lighting systems.

The aim is to create an awareness of lighting needs in people and to allow them to experience possible lighting solutions – all in the space of two hours, the average duration of a visit to the centre.

A half-hour introductory programme in the 'Basics Theatre', explains the nature of lighting and how the eye works, and establishes the link between visual requirements and lighting requirements.

The visitor then moves through a variety of everyday lighting environments. These include lighting in the office, industry and commerce; lighting for relaxation in the home or hotel, and sports lighting. The principles underlying decorative floodlighting and motor vehicle headlamps are also explained.

All demonstration rooms have variable lighting. A great many lighting systems have been pre-programmed in the central com-

puter, so changing the lighting arrangement is simply a matter of pushing a button. In this way the effect of different lighting and luminaires can easily be demonstrated. A conference room for 40-65 people completes what would appear to be the largest demonstration and training facility of its type in the world.



## Philips acquires Narva factory

Philips Lighting took over the Narva lamp factory in Plauen in Germany, on 1 May, 1991, following agreement between Philips Light GmbH (Philips' German subsidiary), and the Treuhandanstalt, assigned by the German government to manage

the privatisation of former East German companies.

The acquisition of Narva Plauen will strengthen Philips Lighting's position in Europe in the field of automotive and special lamps. The factory, which will maintain its Narva brand name for its interna-

tional activities, has annual sales of about 40 million DM.

Given the long term lack of investments in the East German industry, Philips will need to modernise Narva Plauen's factory, thereby giving continued employment to its workforce of 500.

### Metamec buys Courtney Pope

Metamec have just purchased Courtney Pope Lighting and Lighting Workshop as a going concern; they acquired all the products and rights that had formed the companies from the receivers. Metamec, a company known for its clocks, will concentrate on the manufacture of the products and the Lighting Group will concentrate on sales and marketing.

Manufacturing of the products will be transferred from the Courtney Pope's manufacturing plant at Manchester to Metamec's Dereham premises over the next three months.

Metamec had been looking to purchase a large lighting company for some time, as it would fit in well with the existing factory production.

Lighting Group Chairman, Brian Norris, declared himself delighted with the new trading relationship, given his company's experience of Courtney Pope products.

### Osram to make redundancies

One-third of the workforce at Osram's lamp factory at Shaw near Oldham is to be made redundant over the next six months. The company will cease making fluorescent tubes and some incandescent lamps there.

The remaining 540 employees will be rehoused in one building on the site which is currently being refurbished at a cost of £1 million. The Shaw plant will in future concentrate on the production of discharge lamps and some specialist incandescent lines.

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# DIARY

JUNE

**6** **Lighting basics 3: lighting design principles.** One-day seminar in London. Details from Mid Career College 0223 880016.

**7** **Exterior lighting.** One-day seminar in London. Details from Mid Career College 0223 880016.

Career College 0223 880016.

**11** **Lighting basics 3: lighting design principles.** One-day seminar in Manchester. Details from Mid Career College 0223 880016.

**14** **Interior lighting design practice.** One-day seminar in London.

Details from Mid Career College 0223 880016.

**17** **16th Edition Wiring Regulations.** One-day symposium in London for college lecturers. Details from IEEIE 071-836 3357.

**18-19** **Safety in live entertainment.**

Conference in London arranged by CIBSE, 081-675 5211.

JULY

**15-19** **Interior lighting course** arranged by the Institution of Lighting Engineers at Trinity and All Saints College, Leeds. Details from ILE 0788 576492.

## NEWS

### Lightex '91 to be held at international centre

Lightex, the Institution of Lighting Engineers' annual conference and exhibition, will be one of the first conferences to be held at the new International Convention Centre in Birmingham.

Both events open on 24 September and continue until 26 September. Roy Hattersley, MP, will open the conference. Subjects for discussion include *An evaluation of public lighting*

as a community crime prevention strategy; *QL: a commercial induction lamp*; and *The practical use of compact fluorescent lamps in public lighting*. A further topic to be considered is 1992.

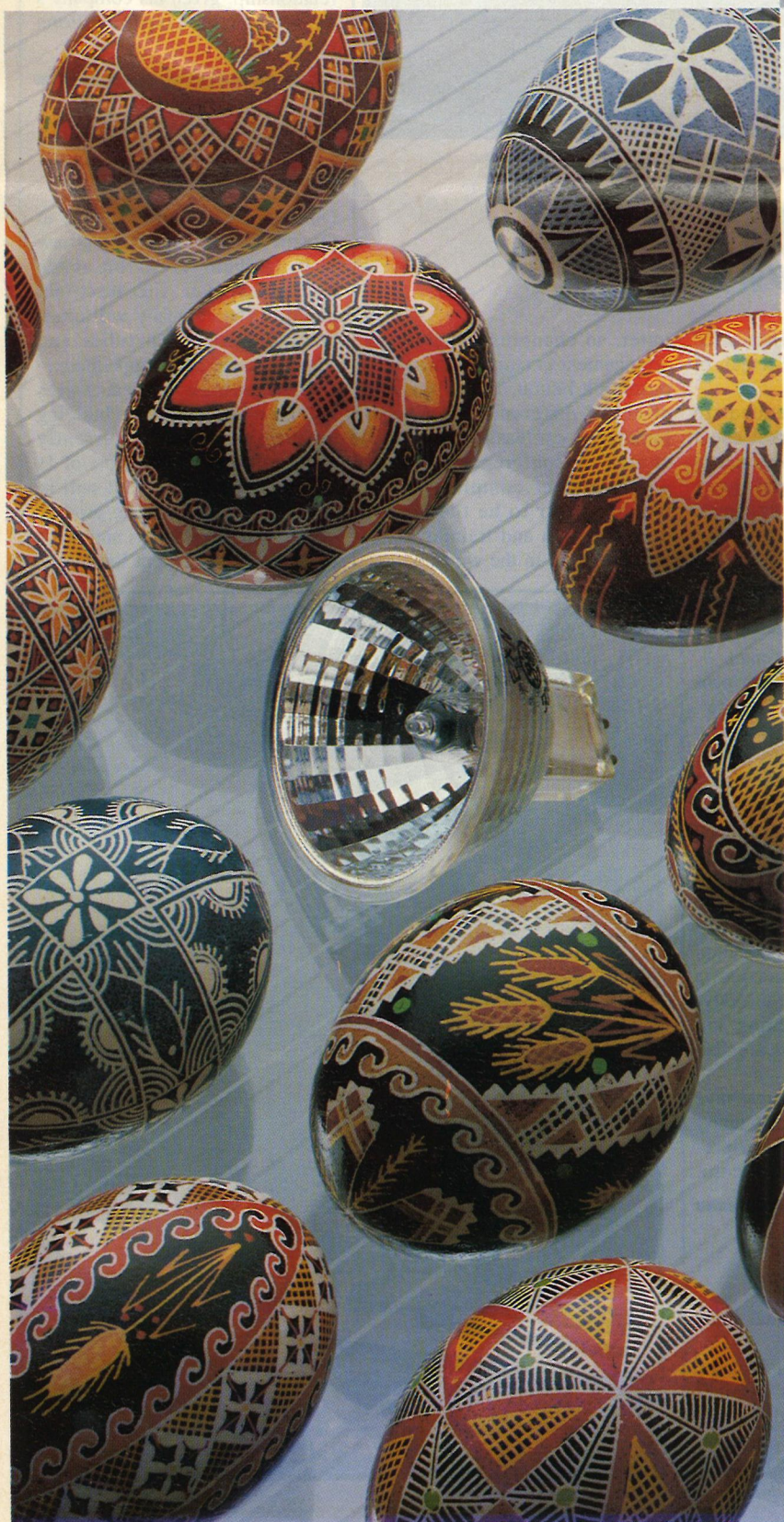
The exhibition will cover exterior and interior lighting, and associated products and services. For further details contact Mrs D Barnes at the ILE on 0788 576492.

### BS on lampholders

BSI has just published BS 6702: 1991 *Specification for lampholders for tubular fluorescent lamps and starterholders*. It is the English language version of EN 60 400: 1989 and supersedes BS 6702: 1986.

Copies, price £59, are available from BSI Sales, Linford Wood, Milton Keynes MK14 6LE.

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# Taking stock

Like any other organisation, CIBSE Lighting Division does its annual stocktaking. The only difference, perhaps, is that the 'stock' in question consists of our resources, our membership and our achievements, plus a look into the year ahead.

The ideal time for this self-assessment is at the hand-over from one divisional chairman to another – something that took place on 8 May when Alan Wilson, of EDP, Stockport, took over from Lou Bedoes, of Thorn Lighting.

Lou's year was one of great activity, and not a little innovation on many fronts.

In spite of the recession, Lighting Division's membership, in line with CIBSE's as a whole, continued to rise. Particularly welcome is the number of young people joining the Division, which bodes well for our future health. We like to think that the CIBSE Young Lighter of the Year Scheme may have something to do with their interest in joining.

This Lighting Division initiative, with the active support of Marlin Lighting as patron of the scheme, has been particularly well received in the colleges and polytechnics where lighting is taught. The 1991 scheme will be launched shortly.

Mention of education raises the subject of the CIBSE Lighting Diploma and Certificate. An important announcement, due later this year, will make it even more important that those members who qualify for the Diploma – or Certificate – should apply for it.

In the opinion of many, the greatest public evidence of the professional activities of the Lighting Division lies in its publications, and there has been no let-up in this department over the past year, nor will there be in the future.

The *Code for Interior Lighting*, the standard reference work on good lighting practice, is under extensive review and will be published in a new edition next year. Other lighting guides currently on the stocks deal with the outdoor environment, office lighting, building and civil engineering sites, and several older guides are being updated. Due for imminent publication is the *Guide to the visual environment in lecture, teaching and conference rooms*.

The Division can scarcely have been busier in the matter of coming events than it is now. In chronological order, we have:

- ☐ Lighting Seminars at Light Fair '91 (to be held at the Wembley Conference Centre from 22-24 October, 1991).
- ☐ The Waldram Lecture, (organised jointly with the ILE and sponsored by Osram to be given in Bradford on 2 December).
- ☐ National Lighting Conference (5-8 April 1992, in Manchester)
- ☐ Lux Europa (to be held from 4-7 April 1993 at the Heriot-Watt University, Edinburgh).

And that's mentioning only those with a national or international scope!

The new Divisional Chairman, Alan Wilson, will doubtless cover all these matters at his Chairman's Address given to initiate the 1991/92 session at the Institution of Structural Engineers in London, on 8 October.

**Karl Pike**  
Secretary, CIBSE Lighting Division



## Lighting up London's fires

London Fire Brigade has equipped its fleet of fire appliances with the latest high-technology floodlighting. The first contract worth about £500 000 has been awarded to Woodway Engineering for their Hy-light system.

The 96 vehicles initially involved are mainly Volvos and Dodges; about half this number are new machines and the remainder are retrofits.

Two years of development in association with the brigade's technical section ensured that the final product met the exacting specification of the operational fleets.

Lighting can provide up to 3500W from the vehicle's existing standard alternator which does not need to be modified significantly. A vital requirement is that when the floodlights are operating the vehicle can still receive its full normal charge. The configuration provides 2200W of floodlighting at 110V and 40 amps of vehicle charge at 24V at one and the same time.

The main unit for lighting the fireground is a pair of 500W fully-enclosed halogen fittings mounted on a 3-stage telescopic mast which is power erected in under 30 seconds by means of a 24V air-compressor module. The mast can be rotated from ground level to aim the lights.

In addition there are two portable light-units each carrying a pair of 300W fully enclosed fittings. These can be deployed



remote from the vehicle and at long range without noticeable reduction in brightness, using extension cable reels.

The total power is thus 2200 at 110V dc and the supply is centred with respect to earth (chassis) which restricts the earth-fault voltage to a maximum of 55V to ensure operator safety. The system is continuously rated and the vehicle's standard alterna-

tor is not overstressed in any way. An ac supply at 50 Hz is also made available for the operation of power tools.

Interlocks and safety controls prevent such hazards as moving the vehicle with the mast erected, and energising the floodlights with the mast retracted, and these are supported by audible warning devices, signal lamps, and strobe alarm beacons.

## DLA to change name

The Decorative Lighting Association is looking to change its name to The Lighting Association. The annual general meeting endorsed a recommendation from the council of management to this effect, and the membership will shortly be balloted to approve the change.

Immediate past president Maurice Green pointed out that although members' interest "are, and will remain, deeply involved with the retail market sector, there are a growing number of companies who require Association support to successfully address the contracts market."

## LIGS braves the elements

The first Lighting Industry Golf Society meeting of the 1991 season was played at Addington Golf Club on 30 April. Despite atrocious weather and the difficult course the 34 members playing managed to return good scores.

In the morning they played for the KSM trophy with supporting prizes, sponsored by Bill Green of Existalite. Barry Ship of AEG, captain for this year, presented the trophy to the winner I Neale.

Second place went to D Caspell and third place to T Smith (honorary secretary). All competitors were presented with golf balls by David Proctor of GE Thorn Lamps.

Prizes for the Greensomes Stapleford competition were sponsored by Gordon Sugden of Airedale Springs. First prize went to S Haggis and B Green, with second prize to M Bailey and B Ramsay.

The next meeting will be held at Richmond on 11 June.

## More efficient down-under

Architect Harry Seidler's majestic new QV1 building in Perth, Australia includes almost 14 000 customised Thorn ALI light fittings incorporating low brightness Edison Price louveres.

Lighting to the 38 floors of office space features low loss control equipment and high efficiency triphosphor fluorescent lamps. Each floor covers a minimum of 1600 square metres of rentable office space.

As a typical tenant is expected to use VDUs and computer terminals, the design brief required the architects to specify low brightness light fittings to reduce glare and other visual difficulties.

Apart from the use of energy efficient lighting, the power consumption of QV1 will be significantly lower than comparable buildings in Perth because of integrated energy management systems and structural fea-



tures including automatically controlled air conditioning, double glazing and external sunshades.

## Arrow man spearheads LIF

Mike Keevill, of Arrow Plastics has been elected president of the Lighting Industry Federation for 1991/92.

As an active Council member within the Federation for the last six years, Mike is currently chairman of the general lighting section.

He started his career as a production engineer, and has worked both in the UK and France. In 1971 he then moved into general management with a position on the Board of Arrow Plastics and was appointed managing director in 1981.

## ElectroTech space selling fast

More than 500 companies have already booked over half the available stand space at ElectroTech '92, which will incorporate Electrex and Power Plant International exhibitions.

Plans are being drawn up for a seminar programme to run alongside the exhibition, which will take place from 20-24 July 1992 at the NEC, Birmingham.

Further information is available from Electrex Ltd, Wix Hill House, West Horsley, Surrey KT24 6DZ, (tel 0483 222888).

## People in brief . . .

● **S Donald McCullough** has been appointed vice-president and general manager of the European Lighting Division of GTE Sylva-

nia. Based in Geneva, he is responsible for marketing and sales.

● **Bob Matthews** has been appointed sales director of Crompton Lighting.

● **Colin Nash** has become product manager, chargers and central battery systems, at Chloride Bardic. **David Morgan** has the

new position of special projects sales manager.

● **Mark Levett** has been promoted regional director, UK and Ireland, for Thorn Lighting.

● **Gary Davidson** has joined Luna Lighting and is working on lighting scheme design. **Paul Binstead** is to work on product development.

# COMMENT

## Light at the end of the tunnel?

There seems to be a new air of confidence in certain sectors of the lighting industry, in spite of a spate of gloomy stories on the front page of this month's issue.

A number of companies with across-the-board product ranges report increased demand from their wholesalers. This may well be interpreted as an attempt to bring stock back to more normal levels after comprehensive destocking over the past year; but it does show a certain confidence in the future. Curiously, the consumer side of the industry was the first to pick up, with a noticeable increase in demand over the past couple of months. This almost anticipated falling interest rates, and with a backlog of people ready and eager to move home, this trend looks set to continue.

Within the past four weeks or so a similar trend can be detected on the professional front, although here the situation is still very confused.

Enquiries seem to be mostly about refurbishment projects. The buoyancy of supermarket and food chains is reflected in new branches, but the spin-off even appears to be extending to high street multiples on the fashion front. Hotel groups are also seeking to update their existing properties. In the specialist fields, bullish sectors include energy-saving installations and certain types of display lighting.

Of course, a more pessimistic interpretation of this whole situation may well be that as so many companies have recently gone out of business a larger share of an existing cake boosts the confidence of the survivors.

There is no evidence yet of an increase in new-build work: the construction industry has yet to move ahead. Much of this is due to political uncertainty – for the first time in over a decade we are moving into the run-up to an election whose results are not altogether predictable.

Other market contacts report that the situation is also patchy in geographical terms. The south and east regions of the country continue to be weak; they are also suffering a considerable surfeit of office and commercial space, keeping rentals depressed, so that is little incentive to redevelop. Areas such as the midlands and the north on the other hand are experiencing far higher levels of demand.

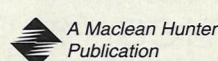
One fact is, however, true: it's very definitely a buyer's market still, and specifiers have been learning to shop around. So, although the level of activity has been grown, the market has become far more price sensitive. In an effort to keep the industry ticking over price margins have been severely cut, so less revenue is generated from an increased turnover – and this is going to be a difficult problem to sort out as things start to move ahead.

## LIGHTING EQUIPMENT NEWS

**Editor:** Judy Sewell  
**Associate Editor:** Barbara Trigg  
**Art Editor:** Lorna Francis  
**Advertisement Manager:** Jim Hughes  
**Northern Area Manager:** Robert Ditchfield  
**Classified Sales:** Alastair Moyes  
**Production Manager:** Mark Sevel  
**Circulation:** Kirtee Parmar  
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# NEWS

## Lighting off-grid

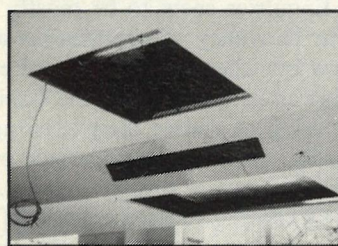
Locating luminaires symmetrically to give correct light distribution within office areas with exposed ceiling beams was a problem posed during refurbishment of Fanum House, the former Automobile Association HQ in Leicester Square, London. It was solved by a computer-aided lighting scheme produced by RADA Lighting.

The beams project some 400mm below the original ceiling of the 1930s building, which made it impossible to create a uniform grid for services throughout the building.

The floor-to-ceiling height was already reduced by the installation of a raised access floor for telephone and data communications services, so the new suspended ceiling could not be set flush to the soffit of the beams without giving aggressively low floor to ceiling heights.

The result is a ceiling still very much in character with the original style of the building, but it demanded precise plotting to meet both the interior design and the lighting requirements.

The resulting ceiling void was particularly shallow, and RADA produced low profile, 600mm x 600mm luminaires to suit. These are three-lamp, air-handling fittings with high-efficiency, low-energy louvres suitable for VDT and general areas.



They are recessed into a suspended plasterboard ceiling – the option chosen to harmonise best with the exposed beams.

All the beams around the perimeter of the building had to

be diamond-drilled with pipework apertures up to 150mm in diameter – painstaking work done mostly outside office hours to avoid noise disrupting the people in occupied offices.

Angled bulkheads were also built to maintain the style of the interior, while concealing air conditioning units.

Overall, the project put a premium on the co-ordination of electrical and mechanical services – which account for more than 50% of the total refurbishment cost.

## Systems on display in Kingston

A showroom has been opened at its Kingston upon Thames office by Electrak International. It is fully equipped for demonstrations and seminars.

Modular linear lighting and power supply systems such as service poles and wall trunking are on show, together with a wide range of accessories.

Included in the lighting options is a module with running text.

Service poles are available with built-in uplights.

The showroom is designed to demonstrate how office systems can be interrelated. Display boards illustrate the ease of installation and special features of each system.

## Erco in Birmingham

LEN regrets that it was misinformed about some of the downlights used in the Birmingham International Convention Centre, described in the April issue. In the main conference hall one-third of the downlights are by Erco. In the Symphony Hall, 114 small downlights giving a wall washing effect are also by Erco, as are some of the downlights providing tier lighting. The remainder are, as stated, by Concord.



The Lyceum, Liverpool, is a listed building dating from 1802. It was constructed as a library and later used as a gentlemen's club. After refurbishment it retains many of the original features, and is divided into three retail units.

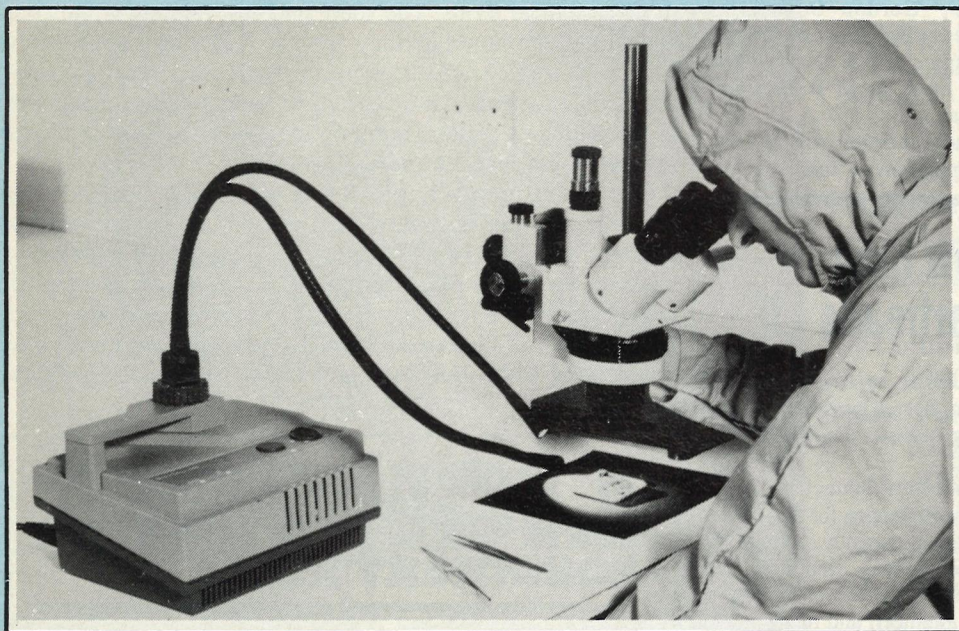
The hall behind the main entrance of the portico is used by the Post Office, and is lit by LB400 luminaires, built into the mountings and counter screens, used as uplighters. The lamps used are 400W metal halide HPI/Ts which give a crisp white light with excellent colour rendering.

Sixty-five luminaires give an illumination level of 350-400 lux with a total installed load of only 27.75kW.

## Trade Literature in brief...

- **Home Automation** has introduced an A5 buyers' guide of its controls and electrical accessories. Tel: 0249 443515.
- **Thousand and One Lamps** has a brochure describing its matching floor standing and wall mounted uplights. Tel: 081-698 7238.
- **Andrew Chalmers and Mitchell's** 24-page brochure gives a guide to the specification of products for hazardous areas as well as details about the company's luminaires. Tel: 041-882 5555.
- **Erco's** brochure Program

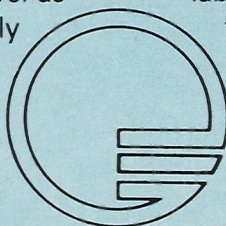
1991/93 is now available. It features many new lighting fittings. Tel: 071-408 0320.

- **Camelont**, Sweden, has a leaflet on its range of Rainbow colour changers and accessories for stage lighting. Tel: 071-580 6334.
- **CIBSE** has published the Spring edition of Hawkwatch, a termly newsletter for teachers and pupils, on building services engineering. Tel: 081-675 5211.
- **Merlin Gerin's** 1991 catalogue of electrical equipment, Final distribution products, is now available. Tel: 0952 290029.
- **GTE Sylvania's** 1991 catalogue of lighting fittings for commercial, industrial and exterior use has been published. Tel: 0274 595921.


## Light years ahead

The Gallex task lighting system consists of an economical range of high intensity cold light sources with a choice of flexible fibre optic light guides. Together they can deliver as much light as you need, precisely where you need it with virtually no heat. The accessories that complete the system allow you to control the intensity, colour

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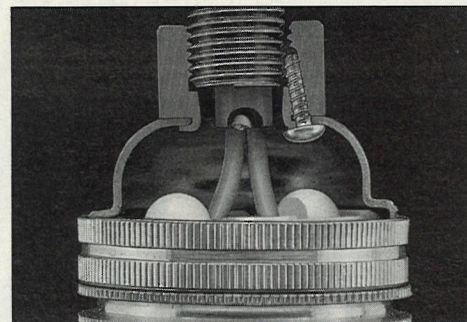
## NEW FROM IMI REEVES

# Three lampholders made to order!

It's always been IMI Reeves policy to listen and respond to the special needs of lighting manufacturers. That's why we've introduced these three new lampholders to our already extensive range. All three have been developed to meet the exacting high standards you expect of IMI Reeves Lampholders.

### \*1510/RTS & PTS SPECIALLY DEVELOPED FOR CHILD-APPEAL LUMINAIRES

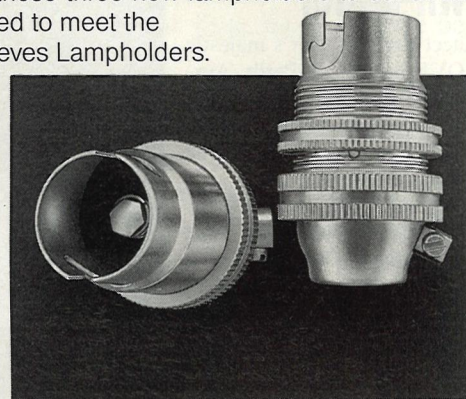
Approved by the Technical Consultant of Decorative Lighting Association. Available in brass B15 size, 12 volts supply with or without Shade Ring. Includes specially developed interior.



### \*2210/2212/2213/RXTC THE PUSH-BAR WITH GREATER GRIP

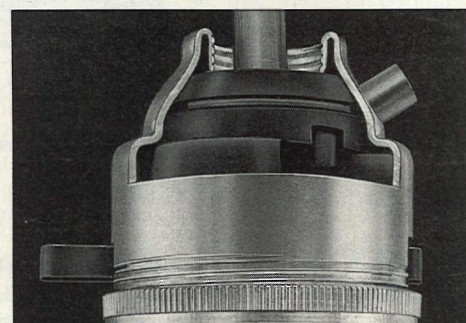
A bayonet cap, push-bar holder incorporating a unique cord grip within the lampholder for extra safety. Grip tested to 50 Newtons.

For details of these three new products and the complete range of IMI Reeves Lampholders write, phone, fax or telex today.



### \*2210/PL/PLT/RL/RLT FOR A BETTER LOCKING LAMPHOLDER

Incorporates a solid brass ferrule and integral pummel which locks the lampholder firmly to metal tube preventing rotation. Ideal for hotel and crystal glass luminaire assemblies.



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# IMI



# NEW PRODUCTS

## Spotlight is compact and cool

Coolspot, launched by Concord Lighting, is a low voltage spotlight in a neat, compact shape. It features a specially designed, integral toroidal transformer with thermal cut-out which allows the luminaire to operate at a maximum ambient temperature of 40°C.

It can be rotated both horizontally and obliquely. A floating endstop eliminates any blind spots.

Dichroic 50W lamps with GU 5.3 or GX 5.3 caps are accepted and the lampholder has retaining springs to guard against vibration.

Versions are available for single track, multi-track or individual mounting. Coolspot is particularly suitable for retail displays of perishable goods.

Reader Service No 160



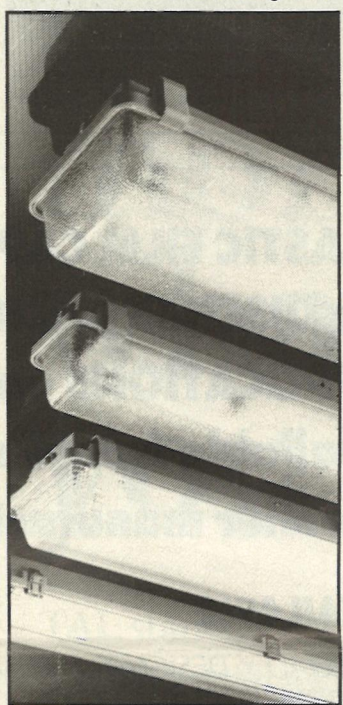
## Weatherproof luminaires

Crompton has replaced its Tufflite fluorescent range with the Tufflite 65 range which is ingress protection rated IP65 and has more options than the previous fittings.

These corrosion resistant, weatherproof luminaires are available in single and twin lamp versions in 600mm, 1200mm, 1500mm and 1800mm lengths.

There is a choice of prismatic or stippled enclosure in either acrylic or polycarbonate with smooth exterior surface to prevent dust build-up and for easy cleaning.

Optional extras include emergency lighting facilities, switch-start, electronic start or high frequency ballast, and for cold stores a low-temperature start version.



quency ballast, and for cold stores a low-temperature start version.

Reader Service No 164

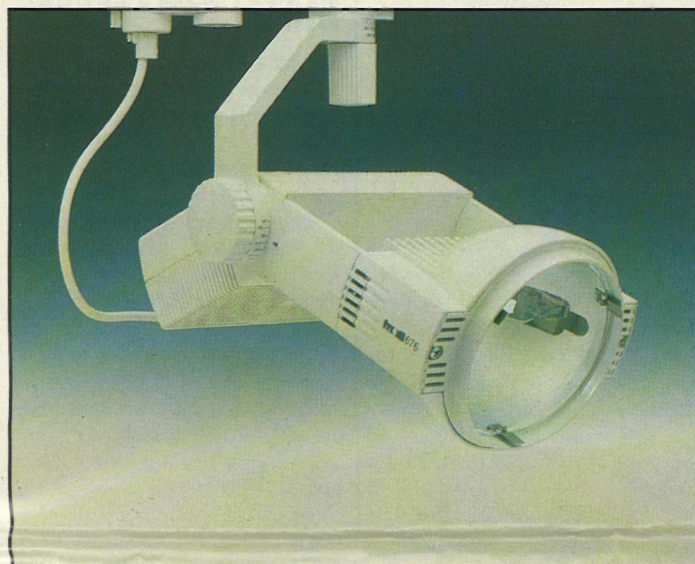
## Metal halide projectors

Vector is a range of metal halide projectors from Troll Lighting. They are designed to operate on Troll's track system. Electrical connection is through twin-circuit track and pendant adaptors.

Either 150W linear or 70/150W single ended lamps are used. Control gear, including a thermal fuse, is integral with the luminaire.

An ultra-violet filter and barn-doors are optional accessories. There is a choice of white, black or metallic grey finish.

Reader Service No 161



## Linear lighting has matching wall lights

Ovalo is an oval-shaped linear lighting system (140mm x 65mm) suitable for either ceiling suspension or wall mounting.

It can be used with twin lamps and an upward-facing diffuser in areas where VDUs are employed to minimise reflected glare.

Ovalo is available from Menvier Linear Lighting in 18W, 36W and 58W modules. There is a choice of opal polycarbonate louvres or clear, reeded acrylic diffusers. High frequency ballasts and emergency lighting facilities can be fitted.

Menvier has developed a range of couplers, connectors and infill modules which allow interior designers to create stylish lighting schemes.

In addition, there are matching tungsten halogen wall fittings for local uplighting and wall washing. Supplied to order, this additional facility enables the designer to carry the Ovalo concept throughout a building.

The system is produced in a



range of RAL colours, however, if existing colour schemes or corporate colours need to be

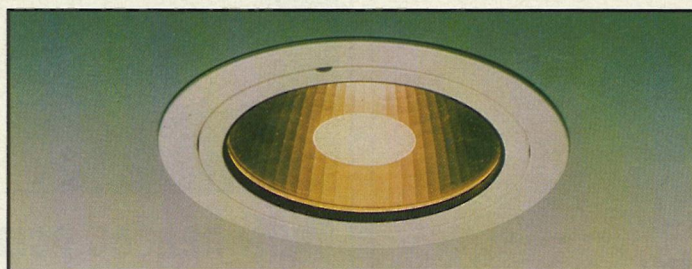
matched, customised colours can be produced.

Reader Service No. 162

## Downlight is powerful

Lumiance has developed a powerful, low voltage, 75W downlight for commercial and domestic display lighting.

Instar 105 Halogen 75 uses a tungsten halogen capsule lamp and is a fully recessed fitting finished in either white, black, matt silver or brass colour. The trans-



former is remotely mounted.

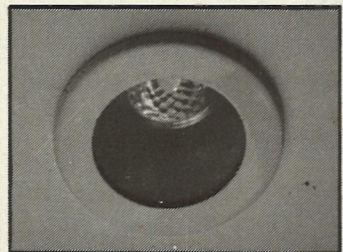
A safety glass protects users from the possibility of an exploding lamp and prevents dust from

reaching the lamp and reflector. The safety glass is also etched in the centre to prevent glare.

Reader Service No. 163

## Downlight for humid areas

An adjustable, low voltage downlight suitable for interiors and some exterior locations, such as



under canopies, is available from Light Projects. There is also an optional watertight seal which provides extra protection in kitchens, bathrooms and other areas of high humidity.

Dichroic lamps up to 50W are used. Black, white and metallic finishes are available, as well as BS and RAL colours.

Reader Service No 166

## Controls for lighting

For ease of use in overseas installations, Hamilton's Mercury Litestat controls now have a voltage selection option.

Extra low voltage switching is now standard, enhancing safety and allowing a choice of momentary type of controller.

For the first time, a panic facility has been incorporated in the momentary control version.

Reader Service No 165

# LIF LINE

## BS 5750 – the reality behind the misconception

Of the many myths floating around the industry at the present time, those surrounding BS 5750 – the question of quality assurance – need to be put to bed once and for all.

The first all-important fact is that BS 5750 does not relate to the approval of products. The assessment relates to a registered company's ability to manufacture products of consistent quality.

The second point which needs reiteration is that BS 5750 is not about consistency without quality. The two must go together. With a BS 5750 approved quality management system as an integral part of a product certification scheme, quality is built into every product. As a result, waste, reworking and call-outs to the site are reduced.

Thirdly, BS 5750 is not expensive to operate. While the setting-up costs can be substantial, the subsequent operation of the system will cut costs through a more efficient operation of manufacturing facilities. With Britain's present recessionary trend such efficiency in operations and an assurance of customer satisfaction are key elements to a firm's continued success.

## International action

A fourth and final point is that BS 5750 is not just a British phenomenon. Our continental counterparts are now getting to grips with its international equivalent EN 29000. This means that to compete profitably in the ever widening market place it is essential that British companies are alert to the international climate with regard to quality and safety and BS 5750 and certification are integral to demonstrating the quality of British products and services.

Having rebutted the myths surrounding BS 5750, it may be worth restating the other advantages, mainly that:

1. BS 5750 demonstrates to government departments and other major purchasers that a manufacturer has a structured approach to quality assurance.

2. Better management of product quality and reduction of defects reduces the risk of product liability suits, particularly relevant in view of the Consumer Protection Act 1987 and the EEC Product Liability Directive.

All the above leads one to ask whether any manufacturer can afford now not to be involved in this quality assurance/certification activity. The Lighting Industry Federation for its part requires all its members to operate a quality assurance system which conforms to BS 5750 and one wonders why any purchaser would wish to deal with non-registered firms. For a list of LIF members and their products, contact LIF: tel: 081-675 5432.



# NEW PRODUCTS

## LV range offers 18 designs

Ultracool is a range of low voltage spotlights and downlights designed and made by Beta Lighting.

An independent, dichroic, optical glass reflector is used in conjunction with M32 50W or M28 100W tungsten halogen capsule lamps.

There are 18 different designs in various materials, including the use of metal and polycarbonate discs.

The Monical fitting incorporates a frosted diffuser, suspended below the lamp by two arms, which reduces glare and creates a



halo effect.

D-Ring has a small D-shaped handle near the swivelling joint,

to facilitate adjustment.

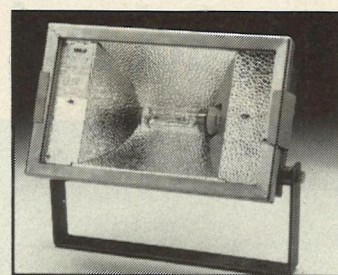
Fin range has an Art Deco feel.

Reader Service No. 151

## Floodlight for zone 2 areas

Andrew Chalmers and Mitchell has a floodlight suitable for use in zone 2 hazardous areas. It uses a 70W tubular high pressure sodium lamp and has integral control gear.

This ExN floodlight is made from marine grade 316 stainless



steel and is highly corrosion resistant.

Reader Service No. 152

## Extra long life GLS lamps

Luna Lighting has a range of SuperService GLS lamps with an average life of 16 000 hours. They have a special tungsten filament which withstands rough handling by stretching when the lamp is knocked or dropped.

This reduces maintenance problems and makes them particularly

suitable for applications such as hotels and hospitals. The lamps have a one-year guarantee.

They are available in 40W, 60W, 75W and 100W ratings with pearl or clear finish, BC or ES cap. Trade price is £1.95 each, all sizes.

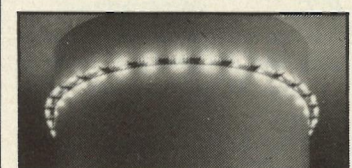
In addition, there are candle lamps and the range will be extended further. The filaments are made in the USA and the lamps in Finland.

Reader Service No. 153

## Miniature xenon lighting system

A 12V lighting system using long life xenon lamps is available from Crescent Lighting.

It can be used to outline architectural features, such as the tops of columns, for lighting bookshelves, as cornice lighting, or in



an aluminium cylindrical profile to provide mirror lighting.

Reader Service No. 157

## Sealed lens for LV lamps with metal reflectors

Sylvania has launched a range of low voltage tungsten halogen metal reflector lamps with a sealed front lens for safer, more reliable performance in display and task lighting applications.

The sealed lens also protects the interior from dust and dirt and from possible damage caused through handling.

Called Professional Metal Reflector, the lamp uses an axial filament capsule, which in conjunction with the front lens gives an even light distribution and symmetrical beam with no "black hole" effect.

The sealed lamp is available in a 48mm diameter version with G4 base, in 20W and 35W spot (10°) and flood (15°) beam angles. There is also a 70mm diameter type with BA 15d base in 20W and 50W spot (10°) and flood (30°) beam angles.

Reader Service No. 158

## Easy disposal of lamps

Simister Engineering Services has an automatic lamp disposal machine which is stated to be capable of dealing with all types of lamp without risk of explosion, fire or flying glass.

Lampcracker Ultimate has been designed to filter heavy metals, cadmium, lead, mercury and phosphates.

Safety features include interlocked switches which stop the machine operating if there is insufficient water, or the skip is removed, or the filter needs replacing. An automatic water heater prevents frost damage.

Reader Service No. 159

## Track adaptor transforms voltage

Edison Halo has introduced a plug-in adaptor for its mains voltage lighting track that also steps down the voltage. This enables low voltage spotlights from the Logoline range to be plugged into the adaptor.

The adaptor is electronic and weighs only 250g. It is 170mm long.

Reader Service No. 154

## Twinlamp HF ballasts

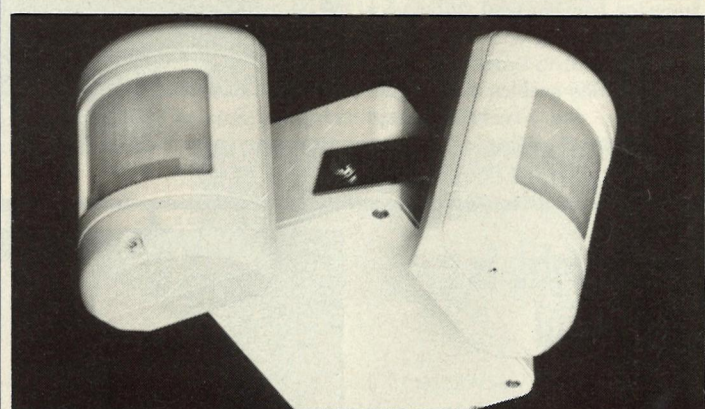
Active Lighting Controls has a range of electronic ballasts capable of operating one or two fluorescent lamps of 36W, 58W or 70W rating.

The ALC Twinlamp is stated to use technology that gives flicker-free operation with lumen output unaffected by mains voltage fluctuations. It is economical in use, with energy savings of up to 30% compared with inductive ballasts, plus savings on lamp replacements due to the extended lamp life produced by soft starting.

In addition, the ballasts can operate single lamps economically and without adverse effect on lamp performance.

Further, because solid state power factor corrected circuitry is employed, the power factor of 0.98 is substantially unchanged when operating as a single lamp ballast.

Reader Service No. 155

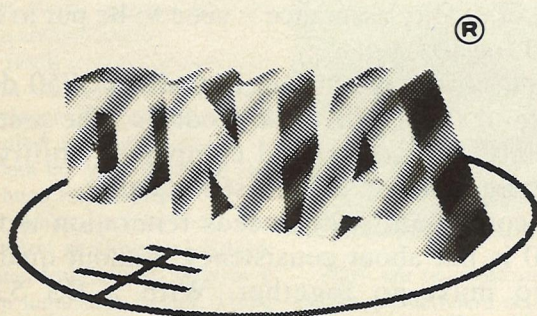


## Multi-headed occupancy sensor

For controlling lighting by occupancy sensor in locations where two- or three-way sensing is required, or where there are

detection difficulties such as blind spots, DEM Controls has introduced the P4 multi-head system.

Reader Service No. 156



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**Light is our business.  
It has been since we invented  
the first lamp in 1879.**



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# NEW PRODUCTS

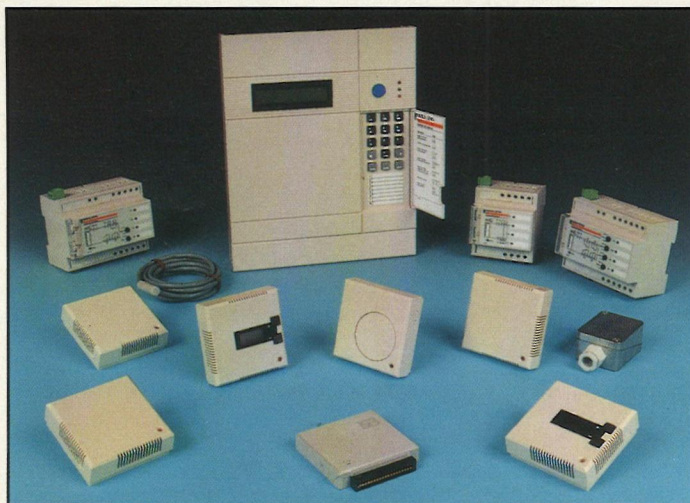
## Control system is bus-based

Merlin Gerin has launched a building control system for lighting, electric heating, ventilation and other loads in small to medium sized buildings. It also has load shedding and alarm facilities.

Called Isis, it is compatible with the BatiBUS communication system developed specifically for building control.

Isis 8G consists of an eight-channel control unit, sensors, push buttons and interface modules. A single, twisted-pair control cable means that installation and set-up is very easy. Merlin Gerin states that a typical system costs less than £2500 on an installed basis, making it affordable for schools, clinics, leisure centres and even certain residential applications.

The programmable central con-



trol can be set up either by using a built-in keypad with question and answer display, or by inserting a cartridge that gives 14 standard configurations. It has a timetable that can be programmed for each day of the week, for holidays and for 10 special days (eg stocktaking). The system is automatically monitored for faults.

Lighting channels can be configured to include, for example, photo-electric cells. Local override of lighting switching can be provided.

The BatiBUS cable linking the

various elements of the system has a working voltage of only 15V and can be run around a building in grooves or conduits without concern for the proximity of 240V cabling.

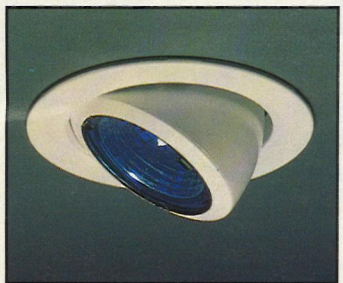
Merlin Gerin will be introducing a range of BatiBUS-compatible products in the UK. Other manufacturers are also being encouraged to design products to operate on the system. Philips Lighting, Nokia and Pillar Electrical are among those who have already joined the BatiBUS Club.

Reader Service No. 167

## Wide choice of downlights

Pixel is a range of directionally adjustable, recessed downlights in two sizes from Forma Lighting.

They are designed to use a wide range of lamps, including low voltage tungsten halogen,



White SON and metal halide. Luminaires using metal halide lamps are supplied complete with an ultra-violet filter. Transformers and control gear, where required, are housed remotely.

Accessories include barndoors, wallwasher attachments, Fresnel lenses, decorative glasses, suspended discs and colour filters.

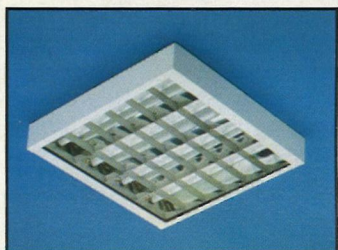
Reader Service No. 168

## Transformer is digital

GTE Sylvania has launched a digital electronic controller which it claims is the safest and most reliable method of stepping down mains supply for low voltage lighting.

It offers original equipment manufacturers a method of transforming any European mains supply voltage into a stabilised 12V output in one compact unit. It is available in 100/130V and 210/260V versions, each capable of controlling loads from 20W-65W.

Reader Service No. 169

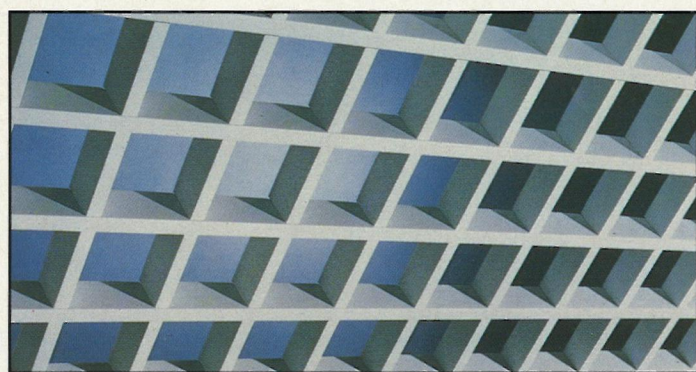


## Fluorescent modules

A series of surface mounted fluorescent modules is available from Tenby Lighting. Aluminium louvres are fitted to the shallow profile luminaires.

Either three or four, 18W or 36W lamps are used. Emergency lighting facilities can be incorporated.

Reader Service No. 170



## Aluminium cellular ceiling

Alutex, launched by Interlux, is a British made, square cell, aluminium ceiling system designed to be supported by exposed narrow Tee table systems.

Its 39mm high and 15mm thick double-walled blades create a monolithic appearance. The system is available in white and other standard colours; RAL and

BS colours, and anodised and metallic finishes, are available on request.

Alutex is supplied in lay-in grid tiles of modular sizes: 600 x 600mm, 1200 x 600mm and 1800 x 600mm; and cell sizes: 100 x 100mm, 120 x 120mm and 150 x 150mm.

The company's low voltage spotlights and downlights, and recessed modular fluorescent luminaires can be easily incorporated into the system.

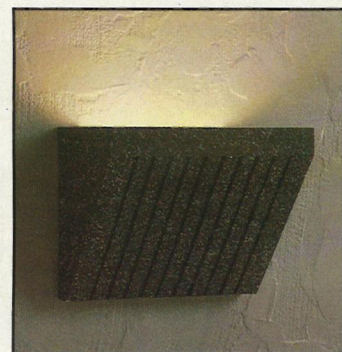
Reader Service No. 171

## Architectural wall sconces

Millford is a range of wall sconces introduced by Designplan Lighting for commercial interiors. They are made from a special plaster based material and form architectural features.

Different finishes are available such as marble, sandstone and plaster, and there is a choice of four designs called Ledge (illustrated), Slice, Segment and Ripple.

The luminaires can be supplied



for compact fluorescent, discharge or incandescent light sources.

Reader Service No. 172

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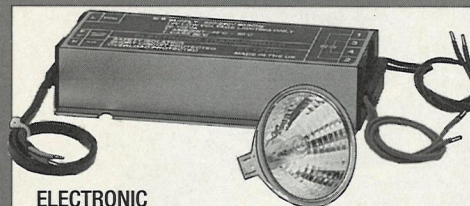


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## RAM

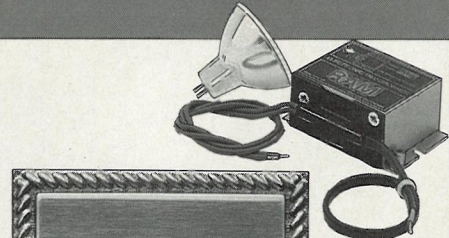
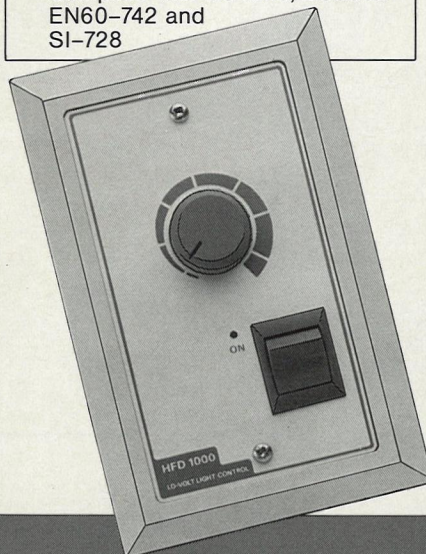
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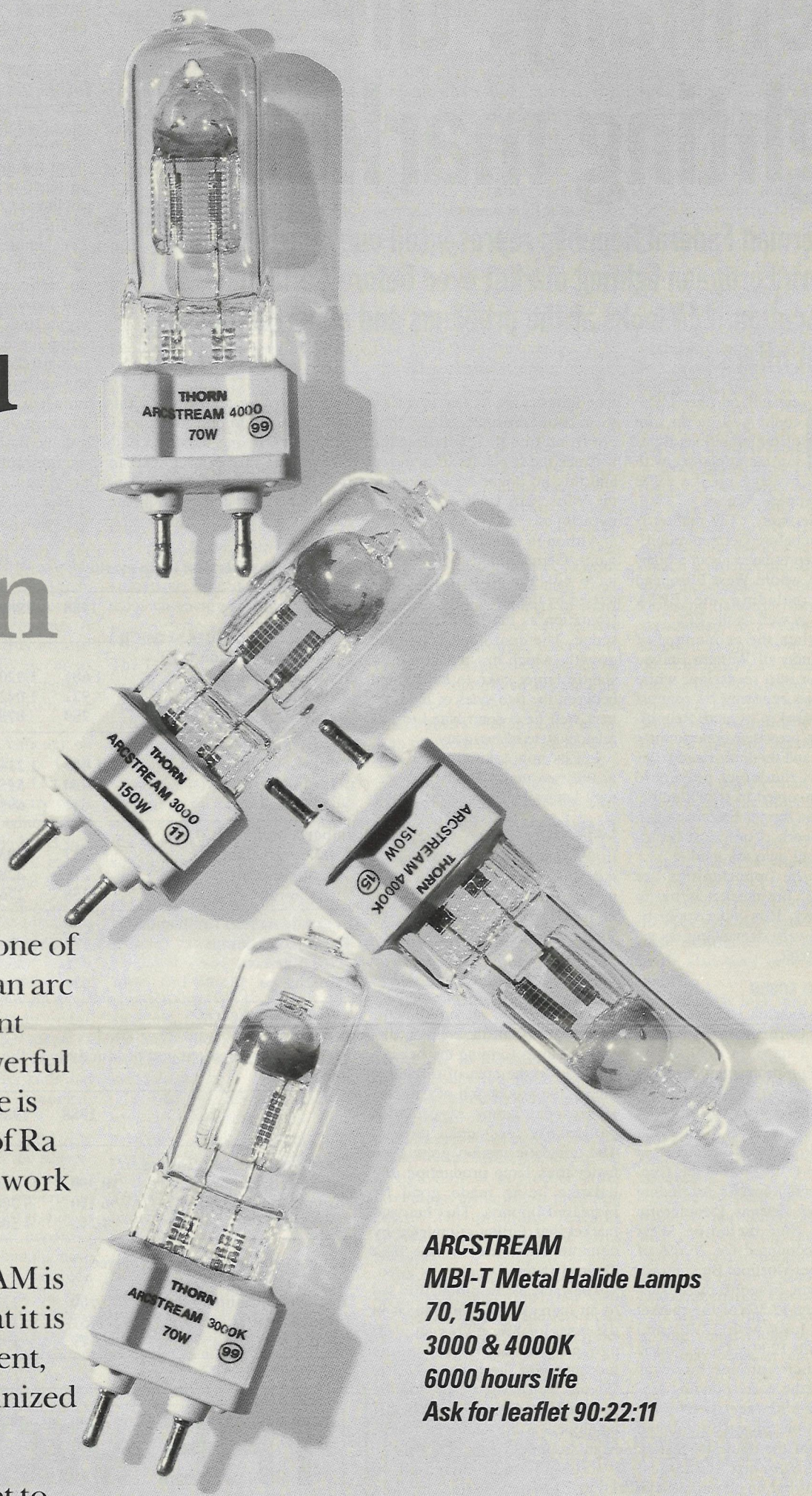
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# Germany: the lighting market

The German Federal Republic represented one quarter of the Western European lighting market even before German reunification. *LEN* looks at the problems and opportunities this market offers.

**'D**eutschland über alles' could well be the aim of the ambitious lighting manufacturer with his eye on the 1992 Single European Market.

Why Germany? The market is vast. Even before German reunification it represented about a quarter of the whole West European market, including the EFTA countries as well as the EC.

Since then the economies of the remainder of Western Europe have gone into recession, while the German economy by contrast has continued to expand. Reunification has provided opportunities for small and medium-sized firms as well as the larger players to become involved in rehabilitation work in the former Eastern sector, and this work is only just beginning to feed onto the market.

While the opportunities are enormous, the market is by no means easy. It is most sophisticated and very demanding, as we shall see later.

## European scene

First, however, just a few figures to fit the German market into a European context. In 1989, 90.7% of West European lighting equipment originated within the EC, the balance coming from EFTA member countries. Of this total lighting production – estimated at some £2447 million – the German Federal Republic (excluding the former German Democratic Republic, but including West Berlin) accounted for 26.6% of European production. By contrast, Britain came in fourth place, supplying only 12.3% of the market – behind Italy with 22.7% and France with 12.8%. Over a quarter of their production was exported (the corresponding figure for the UK was only 6.6%).

In addition, imports amounted to 48.9% of the domestic market making the country the largest importer of lighting equipment in Europe. This makes Germany by far the largest consumer of lighting in Western Europe with 24.9% of the total West European market, compared with the British share of 14.1%.

German employers normally belong to their trade association, and the lamp and luminaire industries are no exception to this. They form two independent specialist groups (Fachverbände) within the Zentralverband Elektrotechnik- und Elektronikindustrie eV (the ZVEI for short), which is the employers' federation for the electrical and electronic industries. The figures and information which follow on the state of the domestic market were, in fact, supplied by the relevant sectors of the ZVEI.

Trade unions cover the whole branch of an industry so there are no demarcation disputes. Negotiations are concluded on an annual basis between the employers and the unions which are regarded as partners in the economy (Sozialpartner).

The postwar need to get Ger-

man industry on its feet again led to a cooperational rather than confrontational relationship between the two sides of industry, and this no doubt contributed to the Wirtschaftswunder (economic miracle) of the 1960s.

Although not always harmonious, German industrial relations have not tended to be characterised by the same degree of confrontation as the British postwar scene. The continued economic growth, which has meant a constantly larger cake to be divided between the two sides of industry, may well have contributed to this relative state of harmony.

Let us now take a closer look at the two major industrial sectors: lamps and luminaires.

## Lamps

In 1990 the West German lamp industry experienced a continued growth in both national and international markets (see Figure 1). The production of lamps increased by more than 3% to nearly 2000 million DM. Of this figure incandescent lamps, at 53% of production, accounted for slightly over half the market, discharge lamps forming the balance of 47%. In the area of discharge lamps, the production of compact fluorescent lamps experienced particularly spectacular growth. The domestic market grew even faster than lamp production, the balance being made good by increased imports. This buoyant market was further stimulated by demand from the former East German states.

The increase in production led to an increase of employment in the range of 8%, giving an average number employed in the industry over the year of 12 100 (Figure 2). During this period the proportion of professional staff employed in the sector increased from around 25% to 27%.

External trade increased to 1990. Imports, after marked growth in 1989, experienced a more modest expansion of some 4% to 625 million DM, while exports grew by over 10% to 1330 million DM. The lamp industry has a particularly high export level of around 56%, compared with an average of one-third for the electrotechnical industries as a whole. This partly reflects the international division of labour in lamp manufacture, but also indicates the degree of success of German industry with its innovative light sources on the fiercely competitive international lamp market. Exports, as we have seen, are concentrated on the Western European market, followed by Asia and North America.

On the lamps front, European integration is already effectively a reality because of economies of scale. However, one burning national issue in connection with the single European market is the Leuchtmittelsteuer – tax payable on light sources – which dates from the turn of the century.

The German lamp industry is

looking to the abolition of this antiquated tax to prevent its competitiveness being damaged with the abolition of European tax barriers. Post 1992, this tax will have to be paid by the German manufacturers not only on the domestic

products but also on their exports, leaving them in a position of disadvantage vis-à-vis their EC competitors who are not subject to such taxation. This is seen as particularly serious in view of the highly competitive nature of the lamps industry worldwide. There is considerable concern that no reaction has yet been received from the authorities in Bonn, in spite of urgent appeals for the abolition of this tax.

The principle behind the Leuchtmittelsteuer seems to be to tax lamps used primarily in domestic, industrial or commercial illumination. Lamps used for signalling, in photocopying or enlarging equipment, those used to start chemical physical or biological processes in science or industry are exempted as are those used in medicine, photographic flash equipment or in cinematographic or photographic projectors.

The tax levied varies from 13 Pfennigs for incandescents under

150mm long to a hefty 30DM for discharge lamps over 1kW.

The amounts of money collected were not negligible. Over the years 1988 to 1990 the amounts collected per annum were 142 million DM, 154 million DM and 163 million DM respectively.

As may be expected, in a country which has always forged closer links between industry and universities and other, research institutions than any other technological development has been a major stimulus to market growth in Germany. Halogen lamps and the compact fluorescent head the growth in turnover, their expansion rates being in double figures.

Halogen lamps are developing as low output point sources, which have proved to be an economical and long lasting light source in accent lighting. In a miniaturised form, high technology lamps are now entering the motor vehicle lighting sector. German motor manufacturers with their concentration on high performance, quality models, have been among those pioneering the use of the new D1 gas discharge lamp which permits the use of very compact motor vehicle headlamps.

In addition to new installations, innovation and rehabilitation work has been a major source of orders on the market. Standard incandescent, fluorescent and high pressure sodium lamps have experienced growth, albeit of a less spectacular nature, as a result of the increased demand for better basic lighting in public, commercial and private sectors. This emphasis on the quality of light can also be seen in the greater demand for high pressure mercury for street lighting, although high pressure sodium is twice as economical.

Latest figures suggest that the domestic market will continue with steady growth for the foreseeable future, the increasing consciousness of light and enhanced demand for renovation acting as a spur. Above all, demand can be expected to come from the former East German states.

Taken as a whole, these trends are expected to give an annual growth in the market of some 4%.

## Luminaires

The German luminaire market also grew rapidly in 1990 (see Figures 3-7). An increase in production of 10.4% concealed a growth in export levels of only

2.1%; this figure, coupled with a 9% growth in imports, means that the domestic market grew by a substantial 13.6%.

A notable point is that this high level of internal growth was a characteristic of the home lighting market as much as the original equipment manufacture sector of the professional lighting market. This growth rate – well into double figures – continues a series of good years for luminaire manufacturers. Even allowing for inflation, the market experienced a real increase in production of 6.7%.

A multitude of factors have been responsible for this expansion of the domestic market. Lighting spaces – private, or in hotels and institutions – are increasingly being equipped with light sources such as low voltage halogen and compact fluorescents. This has increased demand for associated electrical and electronic control gear such as transformers, all of which boosts added value in the components field. The use of these new light sources has naturally influenced the design of luminaires.

But lighting is also tied to changing tastes in interior design, and the decision to purchase new lighting for the home is closely linked to decisions on upgrading furnishings. This sector has remained buoyant in stark contrast to the unsatisfactory state of the new housing market.

The decorative lighting market has also been very favourably affected by the lively new hotels market and, in the retail sector, by the large number of new gift shops.

In the professional sector, a growth of some 17% was recorded in the use of luminaires for discharge lamps. These lamps are mainly employed in the renovation of old, uneconomical installations and in redevelopment projects, so the building statistics are no guide to the importance of this sector.

In the area of commercial lighting, installations with low loss levels and electronic controls have been introduced for reasons of economy, but have at the same time led to an improvement in visual comfort. Above all, lamps for compact fluorescents have experienced a fast growing market. This lamp type has largely displaced the incandescent in downlighting in commercial and public buildings where long service lighting is required, because

Figure 1. The German lamp market

	1988	1989	1990*	% change 1990/89
<b>Production, (million DM)</b>				
Total electric lamps	1 681	1 920	1 982	+3
Incandescent	922	1 042	1 054	+1
Discharge	759	878	928	+6
<b>Exports (million DM)</b>				
Total electric lamps	1 041	1 214	1 330	+10
Incandescent	430	515	608	+18
Discharge	611	699	722	+3
<b>Imports (million DM)</b>				
Total electric lamps	537	603	625	+4
Incandescent	279	328	327	0
Discharge	258	275	298	+8
<b>Domestic market (million DM)</b>				
Total electric lamps	1 177	1 309	1 277	+2.5
Incandescent	771	855	773	-9.5
Discharge	406	454	504	+11

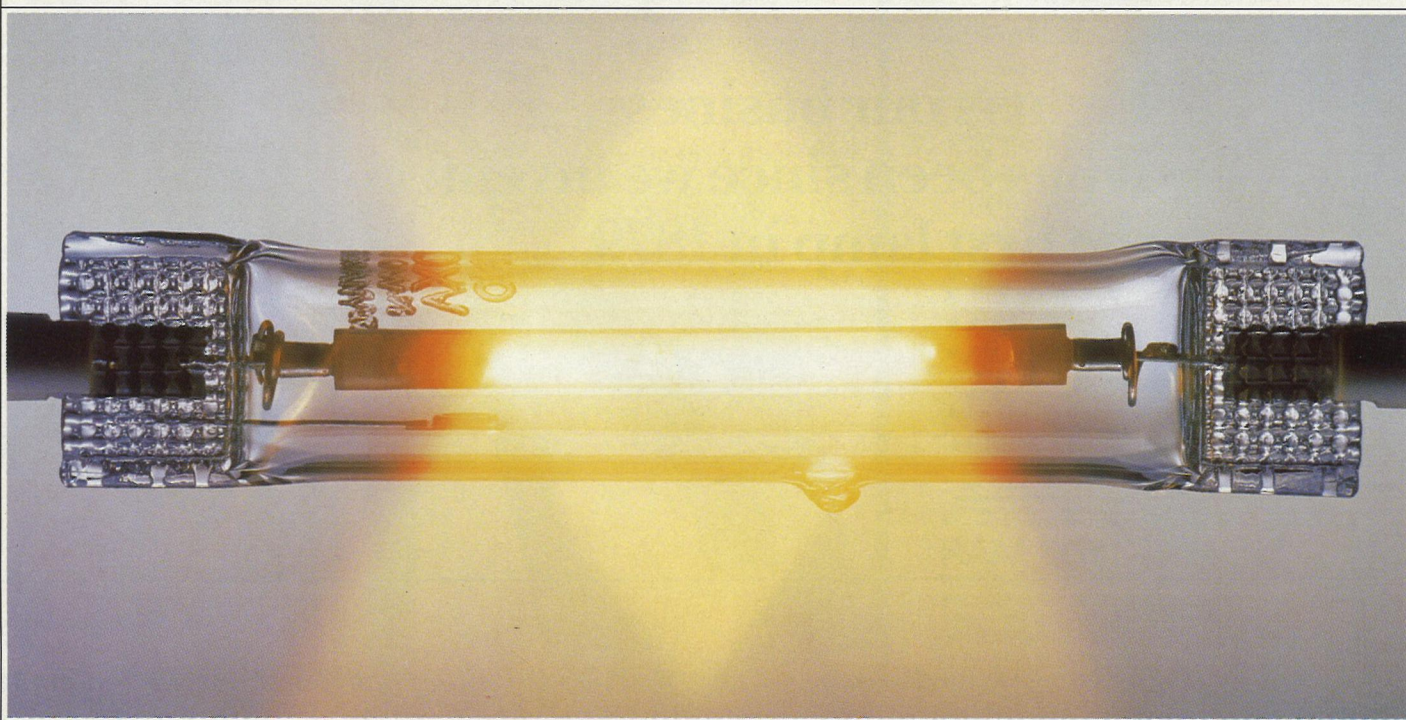
\* preliminary figures

Figure 2. Employment and productivity in the German lamp industry

	1988	1989	1990*	% change 1990/89
<b>Employees (monthly average)</b>				
Total electric lamps	10 350	11 200	12 100	+8
Incandescent	6 110	6 700	7 300	+9
Discharge	4 240	4 500	4 800	+7
<b>Annual productivity/per employee (in thousand DM)</b>				
Total electric lamps	160	172	164	-5
Incandescent	151	156	144	-8
Discharge	179	195	193	-1

\* preliminary figures

# THE WORLD CHAMPION IN LUMINOUS EFFICACY:



3.15 GB



Figure 3. All luminaires (million DM)

	1987	1988	1989	1990*
Production	3236	3509	3797	4194
Exports	(1263)	(1248)	(1510)	(1542)
Imports	710	881	1091	1187
Total domestic market	2683	3142	3378	3839
Price index (1985=100)	105.9	108.7	112.0	115.9

\*provisional figures

Figure 4. Decorative lighting and spotlights (million DM)

	1987	1988	1989	1990*
Production	900	971	1082	1181
Exports	(312)	(265)	(294)	(306)
Imports	287	292	330	388
Total domestic market	875	998	1118	1263
Price index (1985=100)	106.1	109.1	112.5	116.7

\*provisional figures

Figure 5. Professional lighting (million DM)

	1987	1988	1989	1990*
Production	1697	1850	1961	2216
Exports	(587)	(644)	(727)	(799)
Imports	188	278	354	428
Total domestic market	1302	1484	1588	1845
Price index (1985=100)	105.9	108.2	111.5	115.4

\*provisional figures

Figure 6. Professional lighting by sector (million DM)

	1987	1988	1989	1990*
Interior luminaires	1023	1118	1223	1433
Exterior luminaires	338	389	418	456
Lamps with increased protection, (ie vandal resistant, or for hostile environments)	336	343	320	327
Total value of production	1697	1850	1961	2216

\*provisional figures

Figure 7. Other luminaires components and accessories (million DM)

	1987	1988	1989	1990*
Production	632	688	754	797
Exports	(368)	(339)	(489)	(437)
Imports	235	311	407	372
Total domestic market	499	660	672	732

\*provisional figures

of its lower operating costs.

Compact fluorescents are also beginning to compete in the field of architectural lighting, as their use in conjunction with specially designed reflectors opens a whole range of new design possibilities.

Bridging the gap between economy lighting on the one hand and theatrical lighting on the other, is a growing field for decorative lighting with components including downlights, tube and track systems and spotlights.

An average growth in rate of around 20% has occurred in the demand for exterior fittings for discharge lamps. This product group mostly comprises street lighting. Demand has been stimulated through the creation of pedestrianised areas and the replacing of installations formerly designed overwhelmingly for cars rather than people. This has led to the differentiation of areas by the use of distinct forms and styles of lighting.

### The new states

As in past years, statistics continue to give a figure for intra-Germany trade between the territories which historically formed part of the Federal Republic and the former East German sector. This former intra-sector trade was never very important in the luminaires market. The expansion of the Federal Republic in the past year first of all presented the domestic lighting industry with a good increase in turnover of luminaires up to the middle price range. However, expectations of the extension of the designed lighting market throughout the new states are still premature. A marked increase in this area of the country will only occur as current obstacles to both new buildings and renovation are overcome.

By a similar token, although no details are available for the GDR luminaires industry, the fact that in all sectors of the industry work was undertaken by medium-sized companies leads to the belief that small and medium-sized enterprise with branches in the former GDR territories and in Greater Berlin will find excellent business opportunities there in the future.

Deficiencies in market and in technical standards in the former GDR states must rapidly be made good by the opening up of the market. The luminaires sector of the ZVEI is urging its member firms to place orders for parts and semi-finished goods with companies in these states.

On the negative side, the expansionist nature of the domestic industry is attracting an increasing volume of imports up by a massive 21% in 1990. Lower production costs in all countries outside the Federal Republic have been closing the gap between imports and exports. On the one hand, the long delivery periods for some professional lighting products for instance has stimulated demand for foreign goods;

on the other, the weakness of Germany's traditional export markets in Europe and overseas has encouraged the inflow of goods from foreign suppliers into Germany. The below average growth rate of imports – only 2.1% in 1990 – only emphasises the weakness in many other countries' economies.

The development of single European standards by means of harmonisation work within the ambit of the CEN is encouraging the adoption of lighting systems requiring more initial capital but with lower running costs in all EC countries. More efficient products and systems will be installed in commercial and public spaces. Higher light output from the separate lamp families giving a higher degree of efficiency in light utilisation because of the use of mirror reflectors and electronic controls is laying the foundations for future high efficiency installations.

A varied supply and range of types from the lamp and luminaire industries permits consumers to take individual decisions on energy saving.

### Future prospects

The German luminaires industry is confident that the previous year's average growth of 5.6% and 24 700 employees will be maintained or even increased. Average productivity reached a level of nearly 170 000 DM per employee in 1990 although figures varied considerably depending on finish and production schedules. The first months of 1991 saw this growth continue. A notable feature of the economic situation is the continuing trend towards the formation of new businesses both on the designer front and among suppliers of components and parts. The unknown figure in this respect is the large number of small firms which do not appear in the market statistics.

The considerable potential for innovation has been shown by the results of recent competitions, while the over 400 exhibitors present at the 1991 World Light Show at Hannover show the immense range of products available on the market.

### Business environment

There are qualitative as well as quantitative differences between the German and British markets. In fact, the whole business environment is rather different.

This starts with something as basic as company ownership. Germany has a relatively large number of medium-sized and even fairly large companies which are still in private ownership. As a result, the family firm is still quite a noticeable feature – and can exert a considerable amount of political influence, especially at state level. For instance, in the lighting field companies of the size of Trilux and Hoffmeister are still family concerns.

Company finance has also evolved along somewhat different lines. When self-financing proved impossible companies tended to go to the banks rather than to the stock exchange. As a result, investment decisions are taken on a medium time-scale – say five years or more – there has been less need to respond to stock market pressure in the short term. Consequently management has probably been freer to look to long term development rather than more immediate concerns.

There is also a respect of order as exemplified in the law. Thus, the majority of members of board of general companies tend to have a legal background, whereas in the UK an exaggerated respect for financial control and the continuing need to be answerable to shareholders makes board members far more likely to be accountants by profession.

The need for high performance has also been built into business culture. Employees are expected to work hard and conscientiously during business hours. Equally, the German business executive is increasingly less willing to sacrifice leisure time for money. Thus, it is not seen as being particularly conscientious to take work home and neglect to take holidays. This, on the contrary, rather suggests that you are not working properly in the first place.

Turning to the sale of goods, pricing policy is a matter for serious consideration, needing extensive market research. Generally speaking, British goods are not perceived as offering exceptional design flair or any other other advantage attracting a premium price. Any premium features should be emphasised in sales material.

On the other hand, it is not advisable to underprice. The market is more quality and less price sensitive than the UK. Underpricing will leave you at the risk of being dismissed as a low quality

supplier, and the money available in terms of corporate investment and consumer disposable income means that neither are looking for low quality products.

Equally sensitive is the attitude towards inflation. The Deutsche Bundesbank has shown a major preoccupation with its control. Memories stretch back a long way and there is a continuing fear of the type of hyperinflation experienced in the interwar period. As a result of this policy inflation has been kept down to around 2% over the past few years (see price indexes in the tables). Consequently, your German business contacts will not expect to accept rising prices due to higher UK levels of inflation or falling values of sterling, even if this means you must temporarily trim your profits.

Technical barriers to trade still form a considerable though – in the light of the forthcoming single market – a rapidly diminishing obstacle. So, before even trying to launch a product on the German market, ensure it conforms to Deutsche Industrie Normen (DIN standards). In a feature of this length it is impossible to go into the multiplicity of German standards. But up-to-date advice is always available from the British Standards Institution's Technical Help to Exporter section at Milton Keynes.

Finally, the German market is not only demanding in terms of products, it is equally demanding on the services and skills of personnel. Industrial training here is the best in Europe, and not only will your opposite number have an appropriate degree or other qualification, he will almost certainly also have been trained on the job.

An equally high degree of professionalism will be expected of a business partner. In other words, you have to do your homework. Business trips, meeting and appointments must be thoroughly planned to be effective; you can expect negotiations to be both tough and professionally conducted.

However, much of the excitement of approaching the German market is knowing that you are being forced to measure yourself up to the highest challenge the European market can offer.

If after reading these words of advice you decided to go ahead with that German venture then I can only wish you "Viel Glück".

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So it looks as though this World Champion is here to stay.

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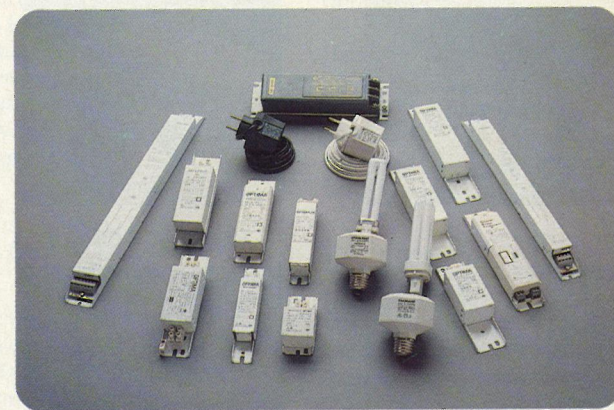
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These pages give information about the larger German lighting companies, including how they are operating in Germany and in the British market.

One thing is certain, German lighting companies have been growing in power and influence in the UK.

According to Gordon Poernig of Generalux, German companies worked for long term profit. "When they needed substantial investment in tooling to produce high quality products, they made that investment. Those small companies in Germany have now become giants. Any product that requires hi-tech tooling now comes from the continent."

He adds that German companies are present in all countries of the world now, even those where the British used to be the strongest.

## Osram

Osram produces lamps of all types, including specialist lines such as photographic lamps. Its worldwide sales amount to some DM 2400 million.

It has 8345 employees in Germany where turnover is DM 785 million. In the UK, there are currently 1400 employees and turnover is DM 203 million.

The transfer of the luminaire business from Osram Ltd to Siemens Lighting Ltd restructures the company along German lines.

Osram Ltd is a wholly-owned UK subsidiary of Osram GmbH of Munich, a Siemens company which ranks third in size in the world for lamp production.

Until 1986, Osram Ltd (then Osram-GEC Ltd) was the wholly-owned lighting subsidiary of GEC with a history which started in 1893 when GEC invested in the manufacture of carbon lamps by acquiring the Incandescent Electric Lamp Company.

In Germany, Osram as a brand was started quite independently by the forebears of the present-day Osram GmbH who registered the Osram brand name in 1906 in Berlin.

Shortly after the First World War, GEC acquired the right to use the name Osram in the UK, as well as in British colonies.

Brand ownership was therefore dependent on country and the two companies, Osram-GEC and Osram GmbH, developed and operated independently of each other. In those countries where

# The German lighting industry:

## A brief outline of lamp and luminaire companies and sources of information



Left: Siemens' luminaire factory at Traunreut.

Its products emphasise the use of high technology and the main plan for the future is to diversify into markets where this can be best applied, such as display and accent lighting. It also intends to step up its export activities.

Siemens recently launched a new company, Siemens Lighting Ltd, to sell luminaires in the UK. Its product range will be derived from those made and sold previously by Osram in the UK, and those designed and manufactured in Germany.

Siemens is no newcomer to the UK. Back in 1843 William Siemens came to England and

founded the British arm of the business.

The formation of the new company follows a restructuring of the UK business after Osram GmbH, itself a Siemens company, took full ownership of Osram-GEC in January 1990 and renamed it Osram Ltd.

Emphasis will be placed on the ability to respond quickly to the special requirements of lighting specifiers. Modernisation and expansion of the Birmingham factory is, therefore, one of the company's first goals. On-line facilities will be installed for the transfer of CAD/CAM information to and from the Lighting Systems Division's factory in Traunreut.

The Birmingham site will also house the head office of Siemens Lighting, while sales and enquiries will be handled by the distribution centre in St Helens.

GEC held the franchise, Osram GmbH traded under the Wotan brand name. This was the case in 1967 when the UK subsidiary was established.

In 1986, Osram GmbH acquired a 49% interest in Osram-GEC with a future option to buy the controlling interest. Under this joint-ownership arrangement Osram-GEC traded in the UK alongside Osram GmbH's wholly-owned subsidiary, Wotan Lamps Ltd.

On 2 January 1990, Osram GmbH purchased the remaining 51% of the company and Osram-GEC became Osram Ltd. In October 1990, Osram Ltd and Wotan Lamps Ltd merged to form one new force in the UK, retaining the one brand name and company name, Osram Ltd, with headquarters at Wembley.

## Siemens

To understand the future of Siemens Lighting Ltd, it is useful to look at its big brother, the Lighting Systems Division of Siemens AG, known within the group as ASI4.

ASI4 is active in the whole of Europe, with manufacturing plants in Eskilstuna in Sweden, Regensburg and Traunreut in Germany, Vienna and more recently, Birmingham. Sales are worldwide.

Projected turnover for 1990/91 is £200 million, of which the UK company's contribution will be

about £25 million. 1600 people are employed by the division, including the 300 UK staff.

ASI4 is involved in most sec-

tors of lighting but its traditional strengths lie in office lighting. It also has some interesting specialities, such as daylight systems.

Elegant minimalist styling, innovative electrical design and robust engineering.

Double-sided Track enables luminaires to be mounted up or down. Straight and curved track sections offer almost limitless configuration possibilities.

Specially designed electrical connections virtually eliminate wiring.

Luminaires rotate 360° in any plane for precise positioning. Range of light sources to suit a variety of applications.

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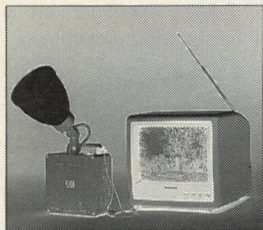
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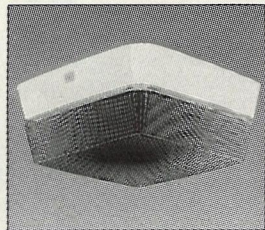
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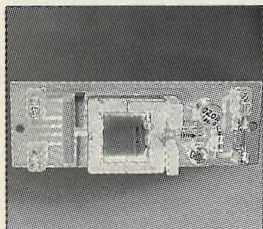


INVERTOR

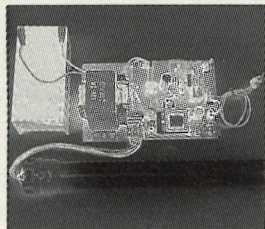
#### STYLISH & POWERFUL



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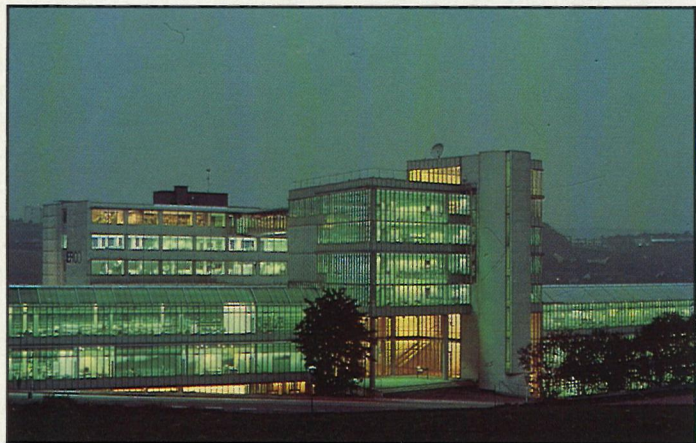
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# facts and figures



Erco's factory at Lüdenschied.

## Erco

Erco was founded in Lüdenschied in 1934 and now employs 800 people in Germany. It had a turnover of 200 million DM in 1990.

Today it claims to be the recog-

nised market leader in architectural and commercial lighting systems.

Its technical department, employing 50 people, uses the latest computer aided design and technology to ensure product quality is to the highest interna-

tional standards. It is the only German lighting manufacturer to have approval to use the British Standard Kitemark under the BS5750 system.

The company now has seven wholly-owned subsidiaries across Europe, including one in the UK opened in 1979, which employs 62 people and has a turnover of £10.8 million.

Erco Lighting has undertaken lighting projects at art galleries, shopping centres and concert halls in the UK. Its most recent work has been at Stansted Airport's new terminal and the Birmingham International Convention Centre.

## Trilux

Trilux-Lenze GmbH has three main areas of operation – ceiling louvred fittings, outdoor amenity lighting and sophisticated nurse call systems.

The company, based in Arnsberg and owned by the Lenze family, has a turnover in excess of £100 million. It has a manufacturing plant in France and subsidiary companies in Spain and Italy.

Trilux Lighting in the UK is based in Walton. Managing director, Ken Hale, believes that 'because of the changes to quality in the UK office environment, Trilux can achieve a 5% market share within the next 2½ years.'

## Thorn Licht

Less than ten years ago, prospects for Thorn's German operation were bleak. Now, sweeping changes and a major modernisation programme have brought Thorn Licht to the threshold of a new era.

Manufacturing in Germany was started in 1979, but prospects were poor. But Thorn's drive towards Europe changed all that.

Product emphasis was directed towards higher-tier, sophisticated, low brightness fluorescent fittings. Recently the factory at Neheim has been extended and modernised with a major invest-

ment in CAD/CAM production.

The risks taken in the 1980s are paying off. Profit has returned and turnover has been doubled.

Today, Thorn Licht has a 5% market share in interior lighting fittings, including hospital bed-head systems. It is fast adding to its range. Many exterior fittings were added to the catalogue recently and the 1991 Hanover Fair saw the launch of many more.

A large part of Thorn Licht's output now goes to other countries.

## Brilliant

Brilliant AG claims to be Germany's leading manufacturer of light fittings for the residential and soft commercial lighting market.

Founded over 30 years ago in Gnarrenburg to manufacture hand-blown glasses, the company soon expanded to include spotlights. It now has almost 700 employees and a turnover of more than £42 million.

Today Brilliant, a subsidiary of Emess plc, produces quality modern decorative fittings for the home and office. Its range includes designer desk lamps, domestic pendants, uplighters and an array of stylish spotlights, bathroom lights and recessed lighting, as well as outdoor lighting and lighting accessories.

Brilliant is committed to a comprehensive R & D programme to offer the most advanced product designs, using the latest materials and manufacturing techniques. At this year's Hanover Fair it introduced a series of new lighting fittings and, last month, introduced an environmentally friendly packaging concept to meet new German legislation.

At home, Brilliant supplies all major German store groups while 25% of its products are sold elsewhere in Europe, South East Asia and Australia. Future expansion plans include operations in the USA, Singapore and the UK.

## Waldmann

Waldmann Lighting of Schwen-

ningen, Germany, was founded in 1928, installing electrical equipment, repairing and replacing appliances and motors. The company changed direction in 1958 when it switched to the manufacture of multi-purpose and special workplace lights.

Heavy investment in research and development enabled the company to expand rapidly and new divisions were established to encompass industrial, office and medical requirements throughout the world.

Company policy has always been one of customer commitment, continually improving manufacturing capabilities, together with a service department that can supply any component from any of its products made within the last 25 years.

Midland Machinery Services in Northampton, was formed by Glyn Lake in 1976 and became involved with Waldmann Lighting in 1981, offering a basic range of luminaires to industrial users.

Although limited, the range proved a success in industry due to manufacture to the highest possible standard, with fittings sealed up to and including IP67.

## Staff

Staff GmbH has its headquarters in Lemgo, south-west of Hanover and employs about 600 people. It pursues a policy of worldwide distribution with separate companies in 12 countries and agents in 28 others.

Staff Lighting, the UK company, was set up in 1985 with three people. By setting out to provide excellent delivery, service and quality to its customers the company has achieved significant growth. It now employs 33 people, including sales, showroom and technical staff.

The company's worldwide policy has been to position itself at the quality end of the lighting market, with internal and external ranges suitable for all display and commercial applications.

In the UK, its blue chip client list includes Barclays Bank, Marks & Spencer and Bang & Olufsen.

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## Further sources of information

### Trade and professional organisations

Zentral Verband Elektrotechnik- und Elektronikindustrie eV:  
Luminaire Section  
Stresemannallee 19  
Postfach 70 12 61  
6000 Frankfurt am Main 70  
Germany.

Zentral Verband Elektrotechnik- und Elektronikindustrie eV:

Electric Lamp Section  
Schumannstr. 15  
5300 Bonn 1  
Germany.

Verband Deutscher Architekten  
Ippendorfer Allee 14B  
5300 Bonn  
Germany.

Lichttechnischen Gesellschaft eV  
c/o DIN  
Postfach 1107  
1000 Berlin 30  
Germany.

### Trade fairs

Weltlichtschau  
Deutsche Messe AG  
Messegelände  
3000 Hannover 82  
Germany.

Hanover Fair  
PO Box 283  
240 Sanderstead Road  
Sanderstead  
South Croydon  
CR2 0AJ.

### UK sources of information

Dept of Trade and Industry,  
through regional offices  
(addresses and tel. numbers  
available from Exports to Europe  
Branch 071-215 4794).

German Chamber of Industry and Commerce  
16 Buckingham Gate  
London SW1E 6LB.

British Standards Institution  
Technical Help to Exporters  
Linford Wood  
Milton Keynes MK14 6LE



# IBL – Lighting the way ahead in the 90s

**"Our transformers quite simply sold themselves."** When demand is so high that the only restriction on selling a product is the speed at which it can be manufactured, then you know the company must be doing something right!

This was just the case in the mid 1980's when IBL (Intram Barwell) was set-up to design and manufacture low voltage lighting transformers. Now, although times have changed and the industry has grown at a tremendous pace, IBL has established itself as a consistent market leader in this highly specialised field.

With a reputation for design innovation and uncompromising quality, IBL has recently launched itself into a new phase of growth that is guaranteed to push the market forward and extend the possibilities of low voltage lighting.

And yet the very words 'transformer manufacturer' can still strike terror into the hearts of some users. Unfortunately, the reasons are quite clear: the industry has suffered from more than its fair share of poor quality products for far too long. There is little policing to protect users from this and naturally many manufacturers have been 'tarred with the same brush.'

## Determined

IBL is determined to set itself apart from this trend. And, knowing this, one of the company's main priorities is to give users a guarantee of high product quality. At its new purpose-built premises in Chessington, Surrey, where

R & D, manufacturing, administration and sales are combined under one roof, IBL has been able to expand its demanding new product development and quality control programme. This is now supported by the latest testing facilities, sophisticated C.A.D back-up and fully-automated production lines. It is also complemented by the expertise of highly experienced research and development engineers whose sole function is to design, create and test new transformers and related product prototypes.

## High frequency innovation

Recent developments which are about to come on line include the new Maintenance Free transformer (patent pending) and the Boxed & Fused sub-plate mounted range. These will soon be followed by a range of high frequency ballast units. The ballasts have been developed at a time when high frequency remains one of the least explored



IBL now houses production, sales and administration under one roof in purpose-built premises in Chessington, Surrey

IBL's production lines

but potentially most efficient means of lighting for the 21st century. IBL's H.F. ballast units will put an end to fluorescent flicker, improve energy efficiency and have a much extended lifespan over current lighting alternatives.

Since the mid 1980's all IBL product have been manufactured to the strictest possible British standards. Now that 1992 is just around the corner, the company already tests to UK and European standards because it knows that – apart from personal recommendation – this is one of the few

'marks of quality' that means something to a purchaser when they buy or specify the product.

## Bespoke design

Although IBL sells a wide range of own-branded products 'off the shelf', an important part of the business, and one for which it has an excellent reputation is Bespoke Design. IBL has worked for many years with leading U.K. Luminaire manufacturers to develop and refine electronic transformers that are small enough and efficient enough to become an integral part of the fitting. In fact IBL

was the first to pioneer the 32mm transformer when the smallest possible aperture for lighting fittings was 33mm.

Moreover, as commercial lighting systems have become more complex, the market for low cost, reliable electronic lighting transformers that can be tailored to these individual needs has expanded. After all, sophisticated lighting displays are ineffective without a dependable power supply and opting for the cheapest, standard transformer can impair lighting quality and efficiency in the longer-term.

## Cost-effective option

A bespoke product is often more cost-effective because it can be made to an exact specification, designing-out potential problems before it even goes into production.

IBL's Bespoke Design Service therefore gives O.E.M's access to a wealth of technical expertise and special manufacturing equipment which can be geared exclusively to their needs and, as this usually only occurs on larger orders, tailor-made products can still prove a most cost-effective option.

# Lights up on new ET transformer

IBL has celebrated the production of its 500,000th electronic transformer with a complete specification upgrade on its ET range.

Users of the most popular transformers, the ET075 and ET105 will now benefit from the launch of the 'D' versions of these units which give them full dimmable characteristics with conventional conforming domestic dimmers as well as commercial hard-fired dimmers.

Additional benefits, such as low audible noise and high stability even when dimmed, mean that this upgrade will dramatically increase the flexibility and application of these transformers.

The upgraded 'D' range transformers have already attracted considerable interest from many existing customers well-ahead of the official product launch, proving that you just can't keep a

good idea down. And IBL hopes that this new, built-in dimming flexibility will extend the application potential of electronic transformers to some new users – especially those who might have avoided them in the past because of instability when dimmed.

Along with the upgrade, important enhancements have been made to the thermal running characteristics of both units by further improvements to their circuitry. The construction of both units now includes the use of double sided PTH (plated through hole) PCB technology to improve long-term reliability and to overcome the high levels of thermal stress associated with this type of product. This will enable the ET105/D, in particular, to be run without the addition of the aluminium heatsink extrusion which will reduce the price of the



The newly upgraded ET range, now with full dimmability

unit to the end user.

Also included in the new design is further transient suppression to overcome the high level of mains spikes found on many sites which can cause

catastrophic failure to many types of electronic devices. This additional suppression gives each unit a very high degree of resilience against an ever-increasing problem.

## A leap and a bound for new catalogue

IBL's now familiar product information sheets are to be made available in a fully bound, single catalogue. This new format is intended to make sourcing information a lot easier and should also help users to keep track of it better.

The format for product information remains the same with colour photographs and full

specification, including line drawings, capacities, and standards compliance in each case. This layout has been designed to be equally useful to the wholesaler who requires an over-the-counter sales aid and order reference as to the architect and specifier. As before, the catalogue is available free of charge.



IBL's literature will soon be available as an all-in-one catalogue





The new Maintenance Free transformer – a breath of fresh air for installers and users alike

# Freedom from fusing – the electrician's dream come true

The maintenance free, multiple output LV lighting transformer has at last become a reality with the launch of IBL's new range of Maintenance Free transformers which incorporate auto-reset mini circuit breakers instead of traditional fuses.

The Maintenance Free units can be installed on a 'fit and forget' basis, making the location and replacement of fuses a thing of the past and allowing transformers to be used in previously unsuitable areas: deep within ceiling voids for instance, where previously good access has always prevented their use.

This saves the architect or specifier from having to design-in service hatches or access points and frees the electrician from the time-consuming task of tracking down the transformer and then testing and replacing individual fuses in order to redress the fault – a task seen as an unnecessary evil with transformer maintenance.

## Wiring is easy

The range also allows multiple luminaire, low voltage lighting installations to be supplied from just one transformer. Easy access terminal blocks make wiring-in particularly easy and capacities range from 100 VA – 2 output to 400 VA – 8 output.

## Prevents overheating

Dedicated circuit breakers not only provide short circuit protection for both primary and secondary windings (as stipulated by British and European standards), but prevent the transformer from overheating and guard against the hazards of overload.

IBL's advanced toroidal

technology means that transformers are compact with high power-to-weight ratios and are capable of supplying lamps between 20 – 50 VA, giving exceptional flexibility of use.

## Patent pending

The range has been designed to conform to British Standard 3535 (1990) and European Standard 60742 (1989). IBL believes that the Maintenance Free range is likely to spearhead a new generation of high performance toroidal transformers, and because of its innovative nature and considerable potential, the design has already been logged with the patent office.

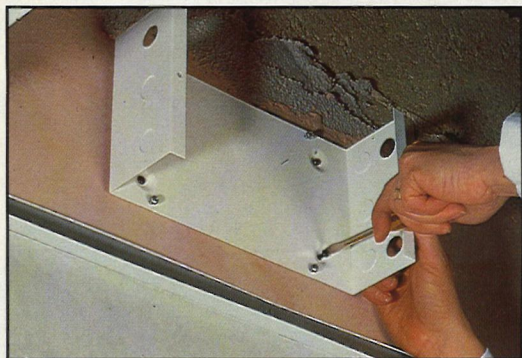
## Boxing clever with new sub-plate mounted transformers

Always trying to develop new products with the installer's needs in mind, IBL's new Boxed and Fused range is no exception.

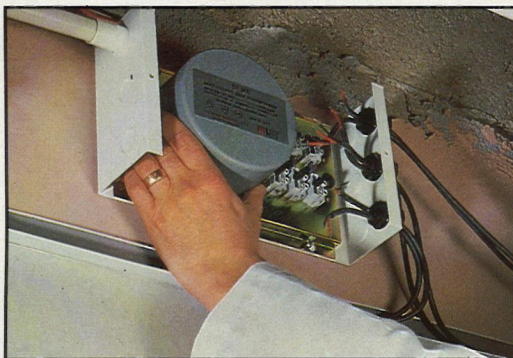
In this low profile transformer, the main assembly is mounted onto a separate sub-plate which enables the back box to be fitted

first with the sub-plate being fixed onto the 'key' hole slots later. This simple two step task makes the professional electrician

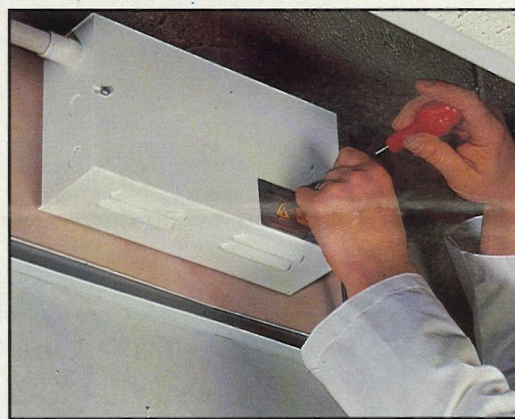
or maintenance manager's job a lot easier than it has ever been before. The initial fitting is both simpler and quicker because the



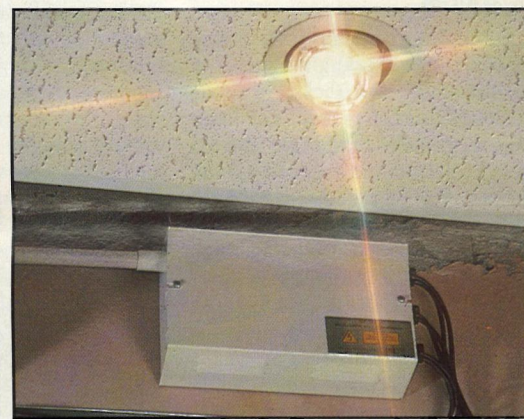
Fitting the sub-plate



Mounting the main assembly



Fitting the cover



Nothing could be simpler!

installer does not have to struggle to hold the full weight of the transformer whilst he's also trying to fix it to the wall or ceiling. When traditional assemblies can weigh up to 10kg or more, fitting them in overhead positions can be particularly perilous.

## Higher power to weight ratio

IBL's new unit takes this weight factor into account with a higher power to weight ratio (up to 50% compared with traditional Boxed and Fused transformers) and smaller outer dimensions to present a lower profile. Each weighs

between 5 and 5.7 kg, with approximate dimensions of 282mm length x 174mm wide x 87mm high. For added convenience when wiring-in, the end panels have a number of punch out conduit holes which can be selected according to the needs of the job plus good-sized vents to give effective ventilation.

## Extended capacity

Because the transformers are multi-output fused with individual secondary windings, should one bulb fail, the supply to the others remains unaffected. Although

50W is the most common low voltage unit, the transformers can also take 20W or 35W. The capacity of the range, currently 200, 300 and 400 watts, is soon to be enlarged with the introduction of further 500 and 600 watt transformers in the near future.

The Boxed & Fused toroidal range is built to conform to BS3535 (1990) and IEC742. Designed to take input supply of 240VAC  $\pm$  6% 50Hz, each unit has a thermal auto-reset cut-out (110°C). Output voltage is 11.60V Nominal and they are categorised as Insulation Class 1.

## The faces behind IBL

Heading up the management team at IBL is Managing Director and co-owner Andrew Penfold. He joined IBL from Penfold Electronics, a company which manufactured dimmer switches and lighting control systems. Andrew's involvement with electronics goes back a long way - to his childhood in fact, when he designed and constructed printed circuit boards and, more particularly, designed and manufactured some of the first touch-plate dimmer switches. Much of the practical impetus behind IBL's new product development comes from Andrew's experience of 'doing it himself'. "IBL has no interest in

design for its own sake," he says, "any product that we bring out must have real, hard benefits for the user. We want to drive the market forward with genuine innovations - not keep it in the dark ages!"

The man in control of the finances, with more than 20 years' experience in accounting, administration and computerised data processing is Peter Osborne. As the other co-owner, Peter has also helped oversee IBL's recent expansion and as the company grows his guardianship of the purse strings means better deals for customers as well as a sound financial footing for the company.

Charged with the responsibility for Research and Product Development is Ed Henderson. Also previously with Penfold Electronics, Ed has pioneered many of IBL's most innovative developments. If you want to know about standards testing or the intricacies of printed circuit boards then Ed is the man to ask.

When the orders are streaming in through the door it is Mick Manning, as Production Controller, who must make sure that the products go out the door with equal speed. He has specific responsibility for overseeing Toroidal Transformer production and staff training in that area.



The IBL management team. From left: Mick Manning, Ed Henderson (seated), Andrew Penfold (seated) and Peter Osborne



# Hanover highlights

A review of some of the more interesting products on display at this year's World Light Show.

Although the major drama at Hanover this year was provided by the lamps sector (see LEN May issue, page 1), there has been a steady increase in fittings designed especially with for use with new light sources. Display lighting showed more restraint than in the past, but this probably had more to do with the decline in the retail market. Office lighting, particularly that suitable for computer intensive environments, still appeared to be a growth area. And the luxury end of the decorative lighting market – the classic and pricey designer luminaires – were also conspicuously present.

High design luminaires from Dutch company **Atomis** come from an ongoing relationship with designer Philip Feenstra. Among the company's range is the Suburb 12V track system. It is claimed that this track can be bent to any angle, its unique PVC and aluminium construction giving a combination of flexibility and excellent electrical conductivity. The track can be shortened or individual sections connected in tandem.

## Glarefree

Luminaires available include a 50W halogen spotlight adjustable to 45° about the track and rotatable about its own axis. The lamp has a glarefree reflector and its back is finished in cobalt blue glass. A 50W halogen floodlight has a ceramic glass diffuser to give a soft light. Also available is a 35W dichroic lamp, and a halogen floodlight with a matt glass diffuser for general and decorative lighting. Finally a spotlight with a 50W lamp is joined to the track by two flexible connections which allow total freedom of movement.

The track is supplied by a 400W transformer which either may be integral or remotely positioned, by means of a flexible lead or fixed mounting. A standard range of connectors, mounts and wire suspension systems provides for most applications.

From the same stable, the Torp range of fittings, comprises a floor standing luminaire and pendant floor or wall fittings. The floor lamp comes equipped with a handle for 350° adjustment of the light source. All luminaires take a 200W linear tungsten halogen lamp.

Finally, Electron is a range of decorative floorstanding, pendant and spotlights in low voltage tungsten halogen taking 50W lamps. The body of the lamps is



Bofill's classic luminaire from Light.

adjustable in all directions. Pendant Electron lamps are also available for the Suburb track system described above.

At the luxury end of the market **Light**, of Belgium, have a range of classic luminaires, originally designed by the French trained, Catalan architect Ricardo Bofill for the Swift building in Brussels. The basic wall mounted luminaire comprises an upper triangular section housing a 26W Dulux compact fluorescent lamp to give uplighting and a partly built-in vertical element with a 36W linear fluorescent lamp. The latter is concealed by an opal glass diffuser. Two vertical metal tubes emphasise the verticality of the direct element of this luminaire.

A 700mm wall mounted luminaire with low voltage uplighter in a semicircular lamp housing uses a 100W halogen lamp. The body, a borosilicate semi-circular tube, sanded internally, diffuses the light of two 20W dichroic lamps. Finally, a floor-standing fitting with a circular head houses a 150W halogen lamp and is internally sanded. The body of the luminaire is formed by four metal rods fixed to a cruciform base. The fitting stands just under 2 metres high.

## Three dimensional

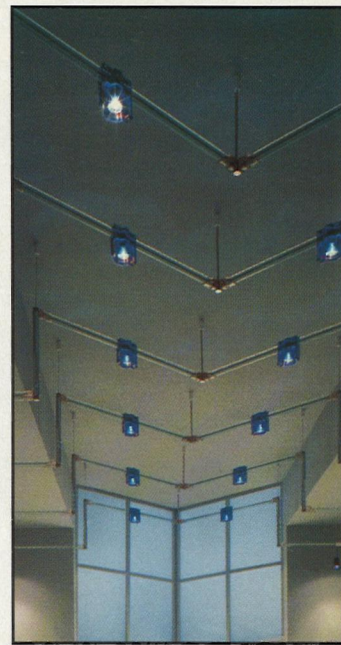
Filigrano from **Staff** gives new three-dimensional design possibilities in low voltage lighting. The basis of the system is a range of transparent glass rods in different modular lengths. A pin joint between glass elements permits the flexible positioning of the rods which may also be at varying heights. The glass rods serve at one and the same time to supply power and to support a row of

decorative light fittings which have been specially developed for the system.

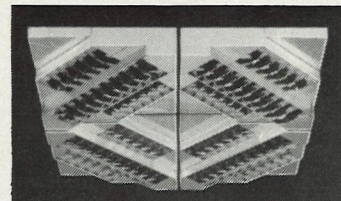
Standard luminaires come in a satin finish or in blue glass; but by means of a special adaptor Uno and Pico spotlights from Staff's low voltage range may also be utilised on this system. The attraction of Filigrano lies in the high degree of transparency and lightness of this system, coupled with the brilliant light produced by low voltage halogen lamps.

## Diagonal

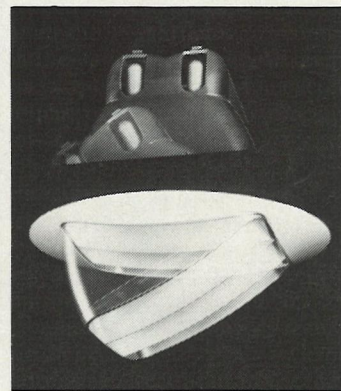
New from **Schaer-Lüderitz** is Selekt, a diagonally orientated surface-mounted lamp with highly polished parabolic mirror blades of varying depths and plain surfaces. The luminaire, 625mm square, takes four compact fluorescents each of 24W. Light is emitted from different levels from the central housing of the luminaire. At the same time two diagonally opposite corners can be used for low voltage lamps or to build in loudspeakers. These luminaires can be used singly but are more effective when used as a



Filigrano low voltage system from Staff.



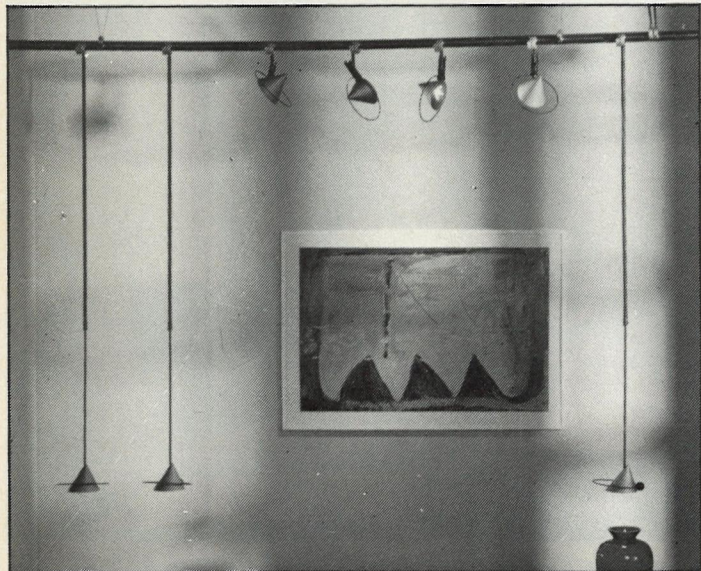
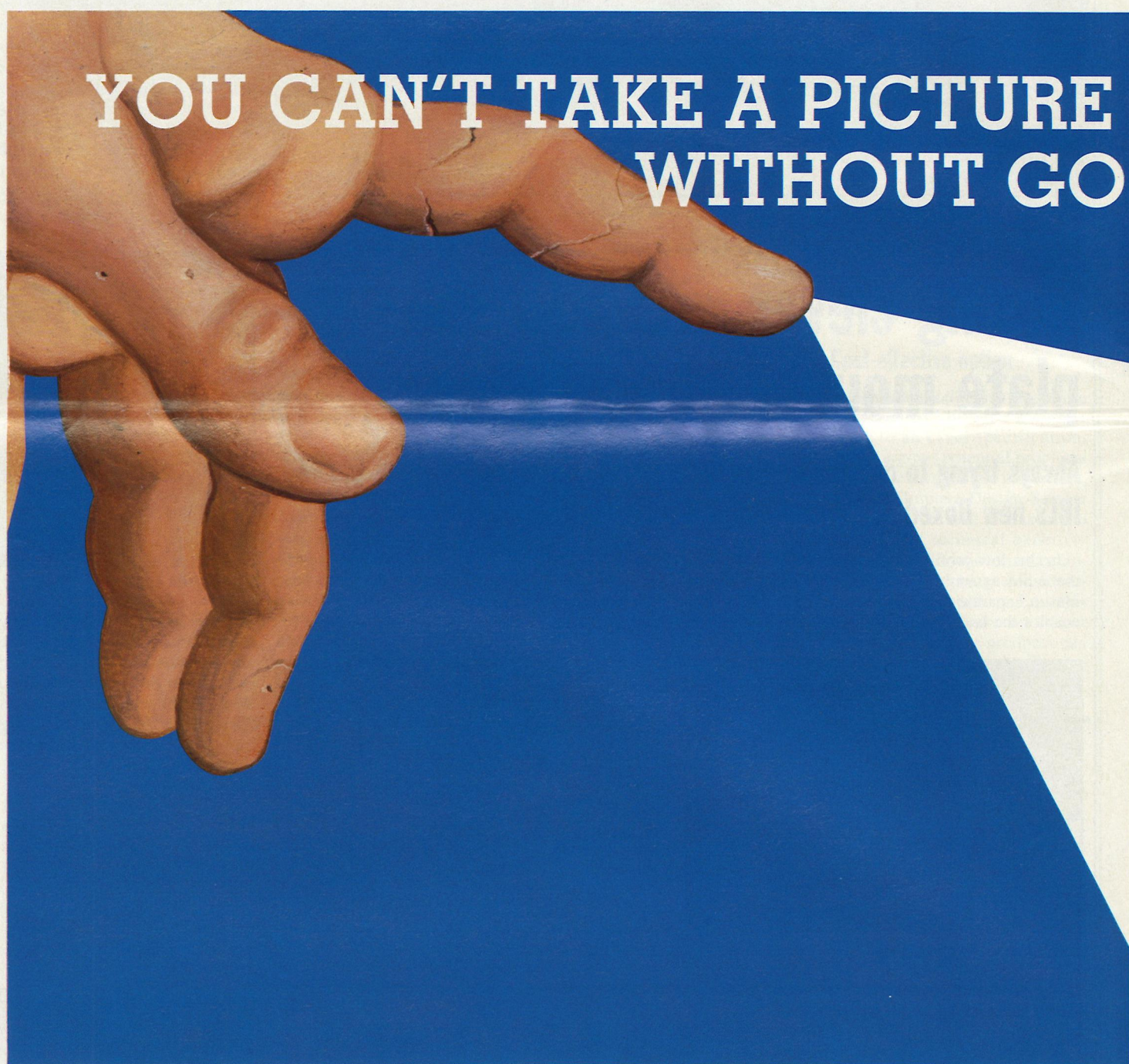
Selekt surface mounted fittings.



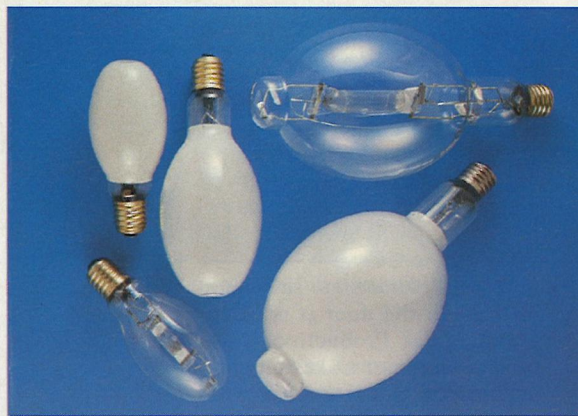
Trilux pivotal downlight with louvres.

group because of the wide range of patterns they can produce. Similar to this, but without the diagonal corners for squaring up, is the Prisma model from the same company.

Also from Schaer-Lüderitz and with decorative possibilities is Skada, a 450mm square luminaire on three different levels taking three 36W compact fluorescent lamps.



The Suburb system from Atomis.



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**Trilux** has introduced a 360° rotatable, pivotal downlight for two compact fluorescent lamps, available with white louvre for uniform luminous intensity distribution. Versions are also available for metal halide lamps (HIT-DE) with incorporated temperature resistant safety glass.

The circular bezel ring is available in white or chrome finish. Both bezel and louvre can be rotated 360° and reflector and louvre can pivot through 30°.

#### Adjustable reflector

A further version has a top reflector adjustable to give wide and narrow angle distribution. The reflector is closed by a clear conical lens with a frosted cone made from silicate glass for decorative effect. A similar downlighter is also available with a frosted fresnel lens. Both are available as one or two fluorescent lamp fittings. The former incorporates a low loss ballast, in the latter version the ballast is remotely located.

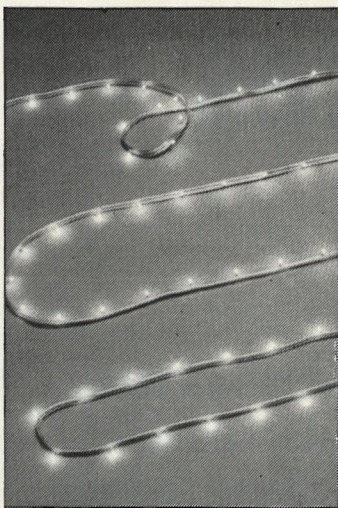
On the display front **Zumtobel** has launched the new Artos range of spotlights and wall washers,



The Artos spotlight from Zumtobel.

designed to accommodate the full range of modern light sources from low and mains-voltage tungsten halogen lamps to high pressure discharge lamps and compact fluorescents.

All luminaires share a common hemispherical shape. The basic range comprises two spotlights: an 80mm diameter model for tungsten halogen lamps, dichroics



RW's cable lighting system can even be tied in knots.

and reflectors lamps for mains voltage circuits; a 120mm diameter model for tungsten halogen lamps of up to 100W and dichroic lamps for up to 75W, for halogen reflector lamps and the 35W and 70W HIT metal halide lamps.

A wall washer version will shortly be coming onto the market to accommodate tubular

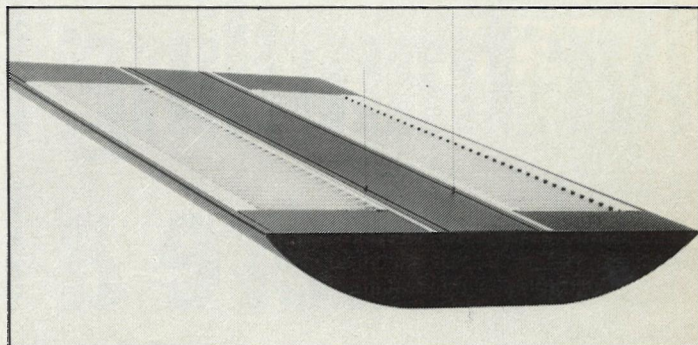
lamps like linear metal halide, high pressure sodium, mains voltage tungsten halogen, and a range of compact fluorescent lamps.

The light unit and control gear are separately housed. This reduces the thermal load on the control gear, particularly important for the transformers for low voltage circuits. The lamps are compatible with most types of track.

More unusual is a modern interpretation of festoon lighting, from **RW**, the company that manufactures the flexible Ciplight system for interior use, comes All Weather Cable Lighting which can be used to pick out trees, building facades and signposts. The transparently insulated, silver-coloured cable contains small waterproof 24W lamps. Highly flexible stranded wire adjusts to any building contour or plant and can even be safely knotted.

#### Minilamps

Lengths of up to 300 lamps in either direction from the feed-in points for the current are possible. The minilamps have an average



The Albatros system gives maximum flexibility.

lifespan of 5 000 hours but can be changed easily in case of damage.

The double cable can be separated if required, and a narrow path is provided between the two sections for nailing. The cabling is available in four different lamps spacings: 3, 5, 10 and 20 lamps per metre.

For more down-to-earth applications **Waldmann** have produced a handlamp using 7, 9 or 11W compact fluorescent lamps in a fitting which is DIN class 2 protected for added protection. A built-in reflector prevents direct glare.

Offices and their ancillary spaces attracted a large number of new lighting systems. Almost any combination of light sources can be incorporated into the Albatros system by **Multiline**.

Core of the system is the central profile piece, 150mm wide, to which one or two wings 235mm wide may be attached. This central core can itself be used as a lighting element, taking a linear fluorescent lamp, built-in or surfaced mounted spotlights. Possibilities are almost endless. Two side wings can be used to give downlighting, for instance, with the central spine providing an element of uplighting. One wing element alone can be fixed to a wall; equally, a combination of one wing element and the core unit fixed to a wall provides both light and telephone services or power. Side wings can be used in uplighter mode with a single direct light centrally placed.

#### Colourful

Albatros is available in a wide range of colours. The central spine may be in the same colour as, or can contrast with the side wings. A clear glass diffuser or aluminium louvres with a painted finished direct fluorescent light. In addition to light, communications systems and power, the central profiles can also take a

Perspex sign system.

Also primarily in the office lighting field, **AEG** have developed a new uplighting system, **Ambilux**, in conjunction with designer **Max Ottenwälder**. **Ambilux** can also be used in entrance halls, foyers and museums. Keynote of the system is variability to cope with a wide range of office conditions and flexibility to handle changes in working practice.

The head of the lamp can be used with a range of compact light sources, giving a variety of ambient lighting levels. The indirect nature of the illumination gives a pleasant working environment.

The electrical supply may be taken either from the wall or the floor. Luminaires take either one or two HID lamps, and come in black or white versions. Wall mounted lamps are easily installed using the wall plate provided.

#### Sculptured form

Finally, **Guapa**, a new luminaire from **Spectral**, provides direct and indirect lighting in a soft, organically sculptured form, which sets it apart from the more severely geometrical shapes usually found in this type of fitting.

Used as a secondary pendant light, the luminaire enables the light source to be brought a metre closer to the work surface or conference table, giving an even level of illumination from 600 lux to 800 lux without danger of glare. At the same time it provides a considerable amount of uplighting to brighten the ceiling. Electronic control gear gives maximum visual comfort.

Mechanical suspension is by steel cables and electrical connections are independent, allowing the suspension height to be freely chosen and preventing strain on the electrical connection.

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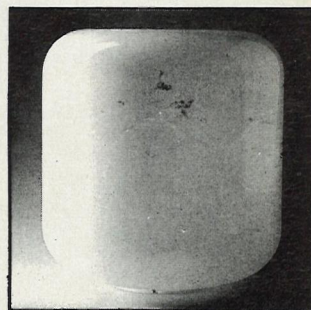
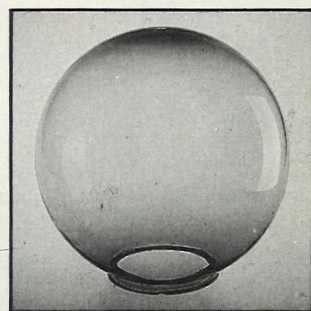
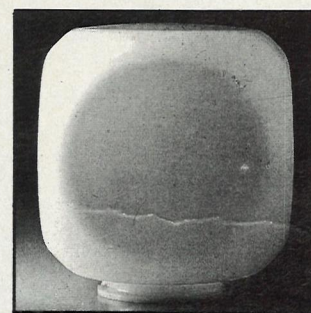
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# Air handling luminaires — is there a limit?

Using the luminaire system as a conduit for the exhausted air from commercial interiors is a long-established practice.

In the UK it is common to use the negative plenum system, in which the air that has been ducted to the working areas is returned to the air conditioning plant by using the suspended ceiling void as a duct instead of having individually ducted grilles fitted in the ceiling.

The installed luminaires are used as the air transfer device from room to void.

This arrangement can be more economical for air conditioning installation, and it allows the

Tests carried out by RADA Lighting suggest that compact lamp luminaires can now be designed to handle greater volumes of extract air than previously thought possible - offering aesthetic and practical advantages in modern office lighting. **Robin Davies** explains why.

architect to avoid a ceiling cluttered with air extract grilles.

It is an approach that is convenient for everybody, but can it meet the new demands that are being presented to it?

Recent developments in lamp design, particularly the argon/krypton lamps and the new com-

compact fluorescents, plus the revolution in office technology, are all combining to present a greater challenge to luminaire manufacturers - and it requires a new approach to luminaire design.

This hinges on the fact that the modern office requires more air changes, with greater volumes of

air passing through the luminaires, while at the same time the lamps must not be over-cooled.

## Lamp implications

The correlation between light output and the operating temperature of fluorescent lamps (Figure 1) is the crucial factor in designing an

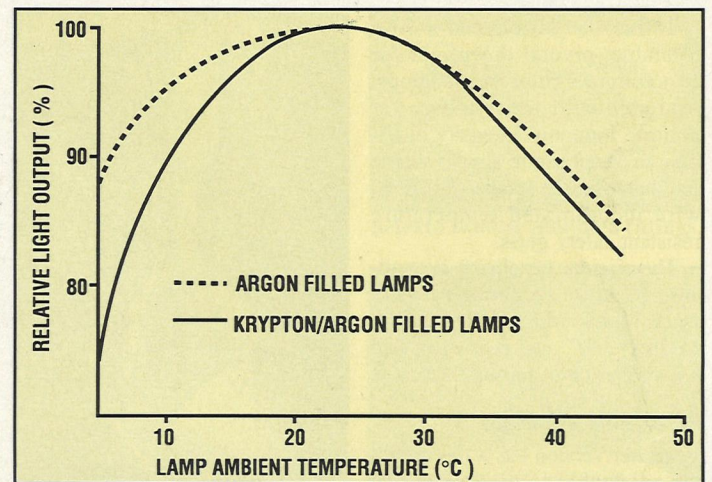


Figure 1. Correlation between light output and operating temperature.

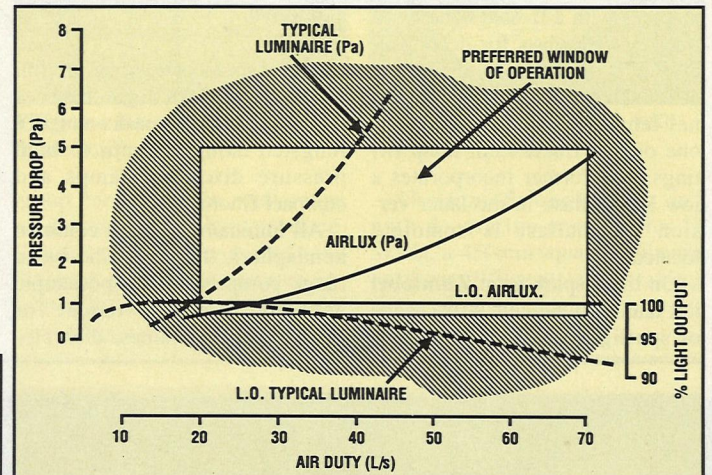
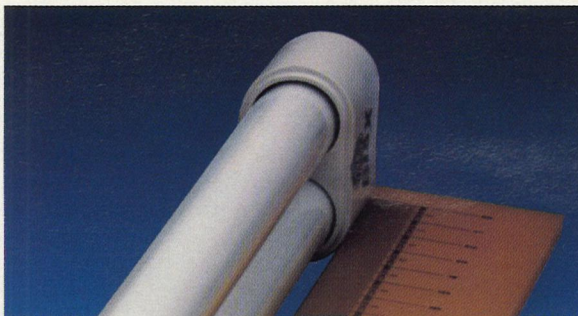


Figure 2. Effect of air handling on lamp performance.

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air handling luminaire.

This is what we have been working on at RADA, using a calorimeter that we installed late last year to produce data on the performance of fluorescent lamps under a wide range of air flow conditions.

The traditional argon-filled fluorescent lamp has a cool spot, an area that runs cooler than any other part along its length.

To achieve the maximum light output we must maintain the temperature of this cool spot at its optimum.

Consequently, the amount of return air flowing over the cool spot has to be closely controlled to avoid diminished lighting performance.

The more recently introduced argon/krypton filled lamps have similar characteristics but, crucially, the light output is more sensitive to over-cooling and, therefore, the scope for air handling appears even more limited.

The new compact fluorescents have added another element to the equation. Traditionally, the cool spot has been found midway

between the lamp caps, but this is not necessarily so with the compact lamps.

In fact, the position of the cool spot on these lamps will vary according to the lamp manufacturer, the burning position, and, significantly, with the design of the luminaire.

I say 'significantly' because, contrary to being a limiting factor in air handling, it now appears from our tests that it can be an advantage if the position of the cool spot is away from the midpoint of the lamp. It may allow us to manage the air flow so that it avoids the cool spot.

This opens up the possibility of designing compact lamp luminaires capable of handling greater air volumes than previously envisaged - so keeping pace with the requirements of the modern electronic office.

## The hotter office

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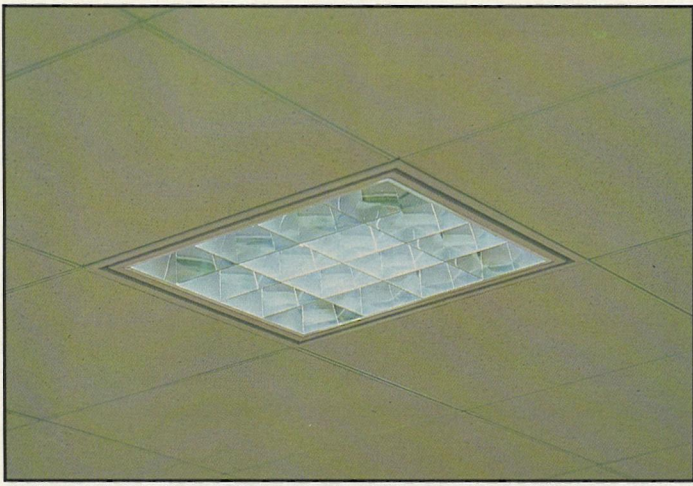
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Adjustable air by-pass slots in the 600mm x 600mm Airlux make the luminaire look as though it is floating in the ceiling.

The HVAC engineer now has to content with the enormous growth of computer hardware that represents a large incidental heat gain in the office.

To extract and dispose of this heat requires higher air duty rates. Values of 60 to 80 litres per second are not uncommon. Against this is the increasing popularity of the exposed grid suspended ceiling systems, which are difficult to seal against cross leakage of air. Negative pressures must, therefore, be kept to a minimum.

All this presents the manufacturer with the challenge of developing a luminaire that will be able to transfer large volumes of air at low pressure, maintain the optimum lamp temperature and deliver

the desired light distribution.

Typically, this might be a luminaire that conforms to CIBSE LG3: Areas for visual display terminals while handling 60-80 litres of air a second at a plenum pressure drop of only 4-5 Pa, and with the lamp operating at approximately 40 °C.

To be certain of fulfilling these and similar specifications, the luminaire manufacturer must have the means at his disposal to determine the actual performance of the luminaire.

The client knows what his air flow rates need to be and he knows what his light output and distribution must be. What he now needs are reliable data to show that the proposed luminaire

will satisfy these criteria.

This is why we built and installed our calorimeter. It enables us to measure air flow rates, the developed pressures and relative light output ratios. Performance specifications can be offered to clients with confidence.

A prototype of this equipment enabled RADA to develop the Airlux range of 600mm x 600mm air handling luminaires.

These luminaires utilise the latest compact lamps within VDT-compatible optical systems, and maintain optimum lamp performance while transferring volumes of 20-72 litres per second at pressure differences of only 4-5Pa (see Figure 2).

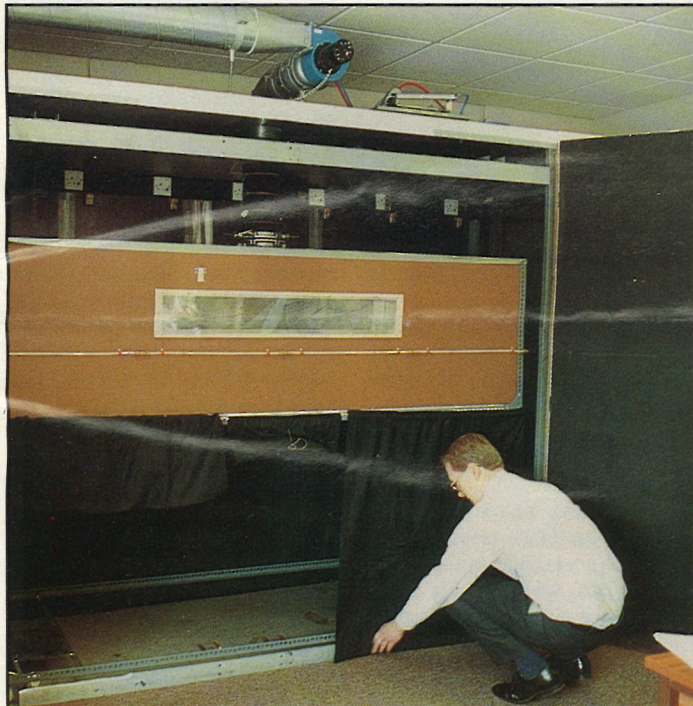
### Conclusions

Recent results using the calorimeter are now indicating that this may be somewhat conservative. It now seems likely that further, quite dramatic developments in air-handling luminaires are possible. We foresee yet more sophisticated lamp/gear/optical designs that will cope satisfactorily with greater air volumes that may be required now or in the future.



Airlux luminaires installed in a new office development at Hanover Way, Sheffield.

## LOW VOLTAGE MODULAR LIGHTING SYSTEM

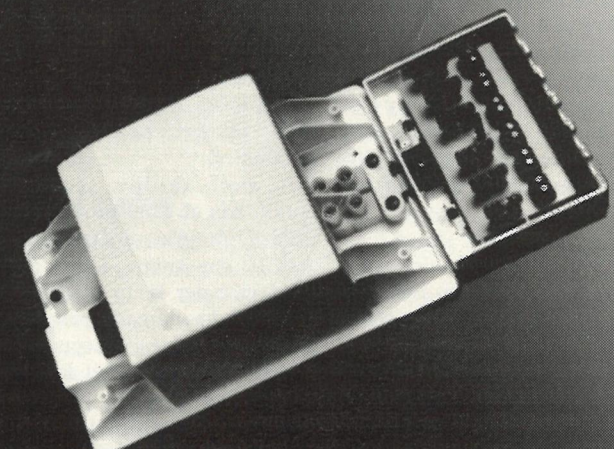


The calorimeter gives data on the performance of fluorescent lamps under a wide range of air flow conditions.



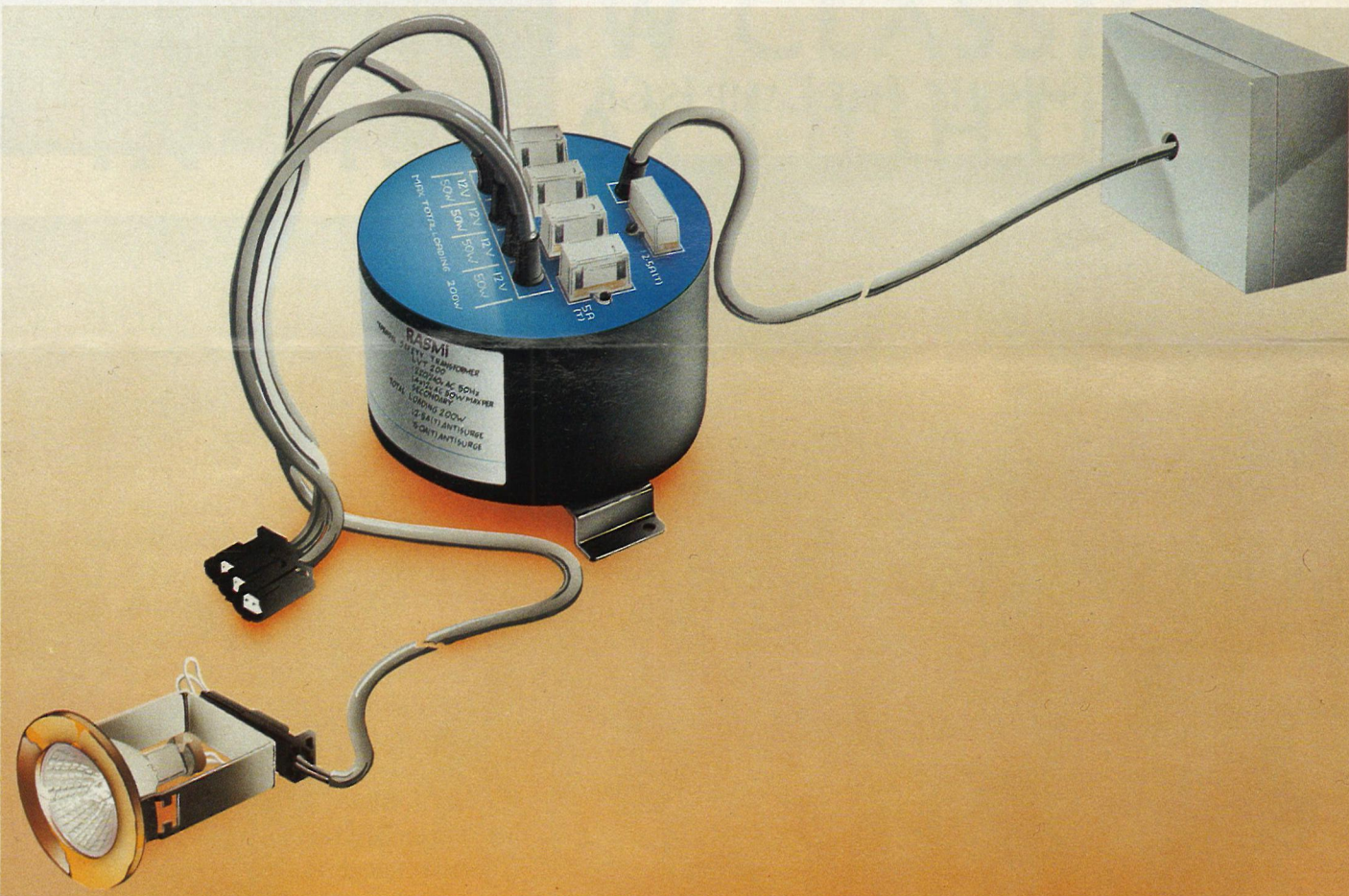
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Rasmi Electronics Limited, Unit 14A, Tanfield Lea Industrial Estate, Stanley, County Durham DH9 9UU.  
Telephone: 0207 232159 Fax: 0207 232016

come in various colours and should a non-standard luminaire be used a short lead with the correct connectors can be fitted before installation.

Rasmi Electronics Limited, Unit 14A, Tanfield Lea Industrial Estate, Stanley, Co Durham DH9 9UU Tel: 0207 232159.

Please forward further information on the Low Voltage Lighting System to:

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# Making the most of lighting

Electronics can bring out the best in high technology lighting. However, its introduction into the lighting scene has not been without difficulties, largely due to poor quality products. *Alan Clough, of Philips, looks at the growing importance of electronic products and the opportunities these create.*

In the last decade, electronics in lighting has proliferated from discrete components in starters and ignitors, to the latest SMD technology for mounting dedicated chips and components onto PCBs in a range of control devices. This development could only have taken place

through economies of scale and, hence, represents volume acceptance in the UK market.

However, while volume acceptance is exciting, it has created commercial opportunities for those with less than perfect knowledge of lamp properties and production tolerances. Thus, on

too many occasions, lamp manufacturers have been forced to defend a good quality lamp against poor electronics.

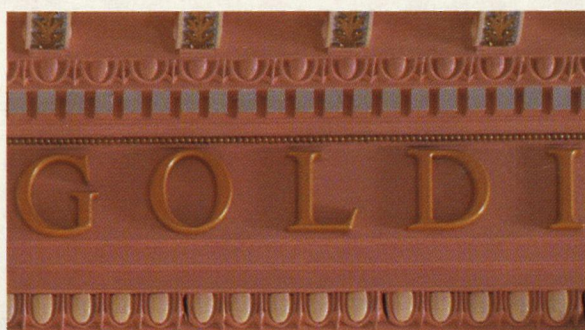
This has manifested itself mainly in short lamp lives and premature and ugly black endings in TL and PLL lamps, and in short lamp lives and early compo-

nent failure in low voltage transformers. Despite this, the UK market has been buoyant and will continue to develop along an even



PLL fluorescent lamps.

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IFS hand-held controller

higher level of technology, as new component and systems are introduced.

Examining products rather than markets, TL and, more recently, PLL lamps represent the highest user acceptance penetration. The obvious benefits are energy avoidance costs, due to the lower circuit watts. Added to this is the potential for simple and complex control systems to avoid wasting energy. These include simple on/off switching regimes as well as infinitely variable dimming to prescribed levels.

In general terms, high frequency electronics has also generated a user who is more conscious of colour rendering, so triphosphor lamps have been to the fore. A largely unrecognised benefit of high frequency systems is increased productivity, not only because increased lighting levels have been the order of the day, but also because 'flickerless' lighting is less tiring on the eyes.

The case for improved productivity is always difficult to assess in advance, but case history is on the side of the original equipment manufacturer when talking to clients. It should always be remembered that marginal improvements in productivity can make energy savings fall into insignificance and are rightly part of the dash flow benefits for the user.

### Confusion

Looking at the products available for TL lamps there has been some user confusion. Basically, there are three systems – one optimised for dedicated HF argon lamps, one for standard krypton lamps and the newest which provides equal light output for both argon and krypton lamps. The argon lamps are only available in triphosphor options and, when used with their optimised ballasts,

are undoubtedly the most efficacious system and should be the first choice. However, all options will operate all lamps to a greater or lesser efficacy. For dimming, it is wisest to use the optimum ballast for the lamp chosen, more particularly at the lowest levels of light regulation.

Contributing to the market confusion have been the dimensional sizes of packages on offer. Initially, a single long slim ballast was the only choice, but more recently two and three component packages have become available. This was due to market factors as OEMs faced space restraints in existing luminaires.

In determining the choice for PLL lamps, which are argon types, no confusion exists. Interestingly, for PLL 40W and 50W lamps, electronics was the first choice control system, indeed it remains the only viable option.

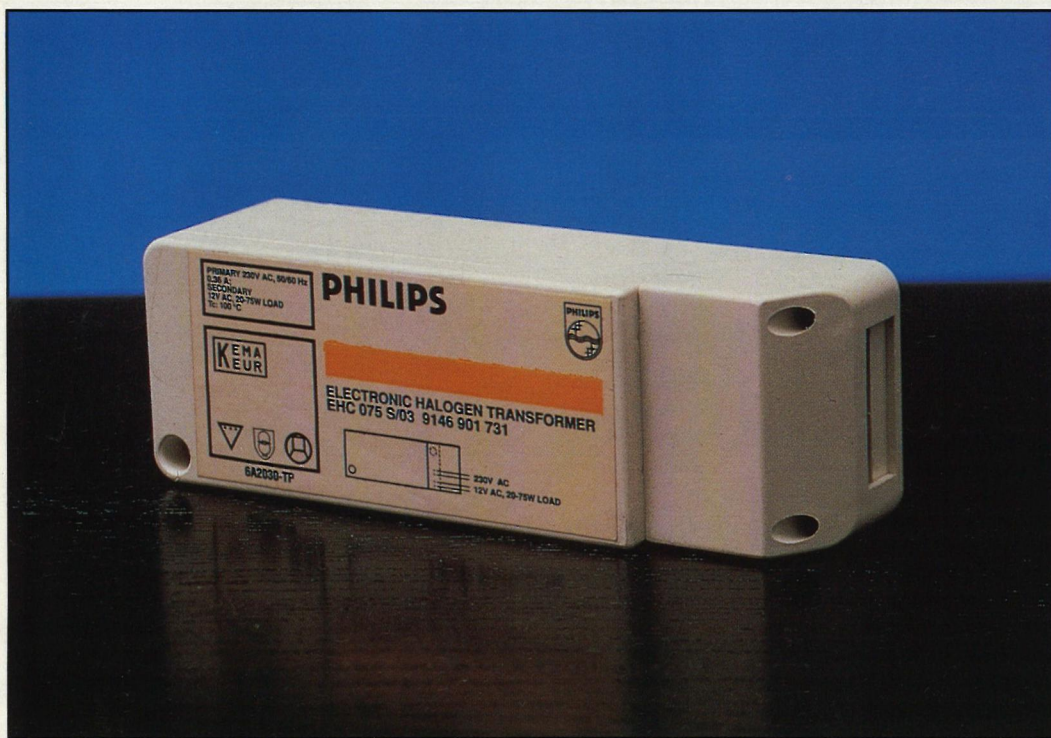
### Looking ahead

For the future, PLS and PLC lamps will have electronic ballasts available. However, it is doubtful if these will command the same market acceptance as PLL versions. The controlling factor for their penetration will be the first cost considerations. It is unlikely that the highly price-sensitive applications, where PLS and PLC are dominant, will allow high market penetration of electronics.

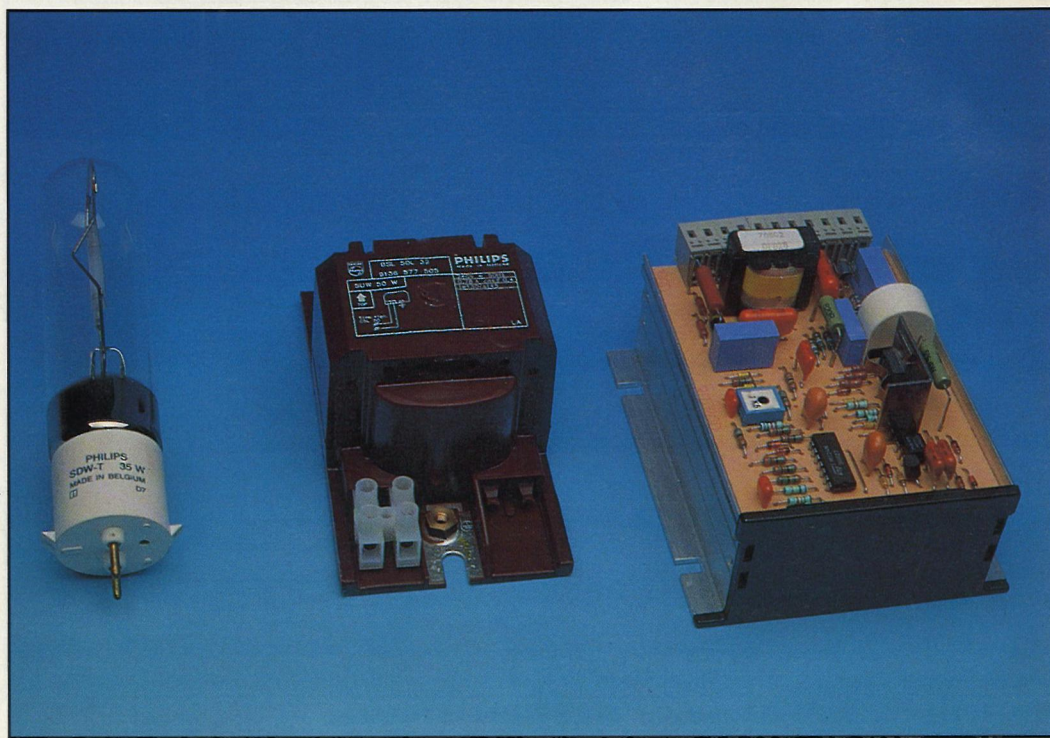
A more readily acceptable option has already proved to be PLC-E integral electronics ES and BC cap lamps. This will be the consumer lamp of the near future. It has already penetrated government establishments and is being promoted at that level for the national benefit.

An area commanding extreme attention of users, OEMs and electronics suppliers is low voltage halogen transformers. A perceived user benefit of LV lamps is their small size. It follows that integral gear luminaires must also

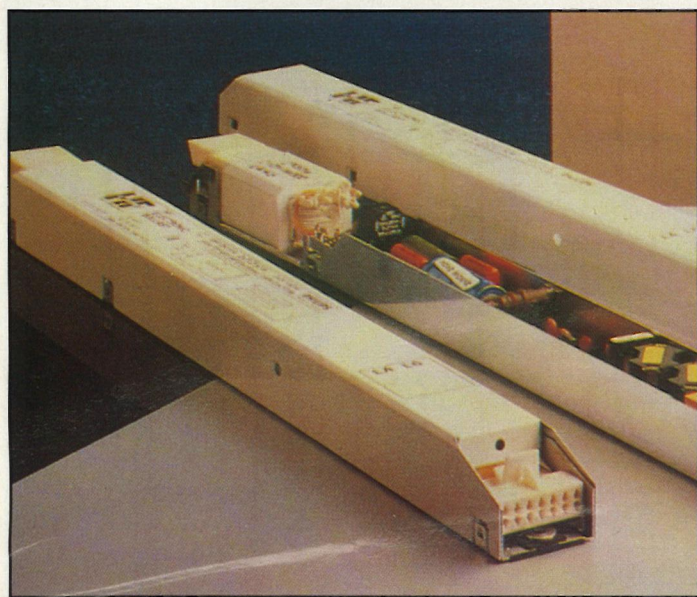




Electronic ballast for halogen lamps.



Electronic ballast for white SON.



Electronic ballast for HFR.

be small. Hence, it is not surprising that OEMs demand electronic transformers, fitting their current designs. Thus, shape is critical and, by definition, demands a proliferation of transformer options. This is not helpful to electronics companies in developing volume and so reducing market price. Nevertheless, we live in a market driven society and so this will continue to happen.

The historical record of poor practical installations, represents an equally sensitive area. hence, the better electronics companies are paying attention to such areas as:

- auto reset overload;
- auto reset short circuits;
- safety conformity with standards such as IEC 34C and SELV (safety extra low voltage);
- 4kV input/output insulation for added safety;
- electromagnetic interference or compatibility (EMI or EMC) for mains pollution and direct radiation.

Many of these features required by the market have an influence on transformer size. Therefore, while safety is always a first demand, electronic ingenuity and luminaire design will need to play a major role before electronic transformers command the major market penetration that they seem to deserve.

### Personal control

As a development of fluorescent and LV lamps, a degree of personal control is beginning to come about. Initially, this will be in cellular or bespoke offices and in dedicated areas such as display rooms and areas. As little as five years ago, this would not have been true, but with domestic 'in chair' control and programming of HI FIs, CDs, videos and TVs, lighting seems to be a natural progression. With the improved reliability of such hand-held con-

tronics and total compatibility with its lamp environment. This will benefit the whole of the distribution chain, because lamp

companies can be expected to see the system as their territory, which will ensure good electronics.

So the days of a lamp maker 'only' being required to manipulate glass and metal are firmly behind us. The modern lamp

maker is also an electronics company – with all that that implies in development of new products and markets.

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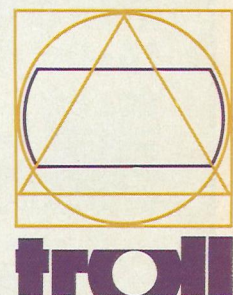
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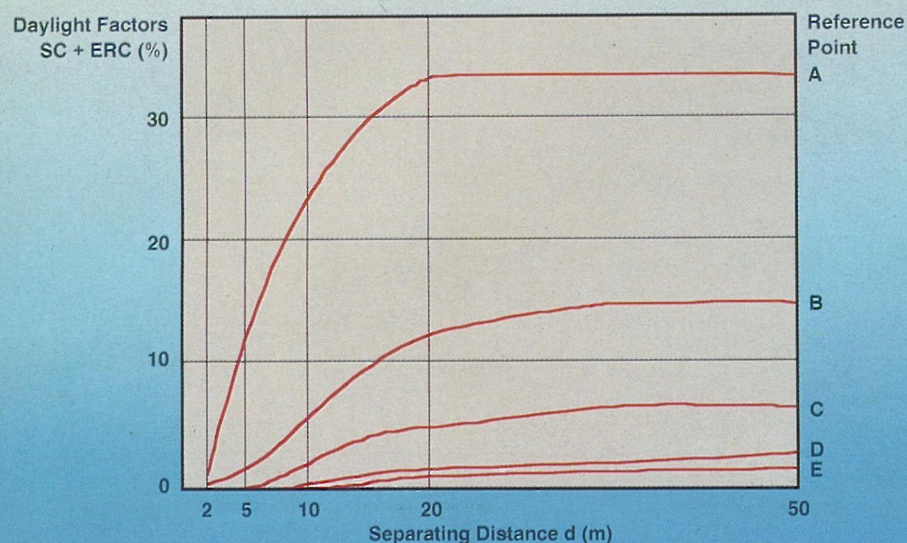
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### Effect of the Obstructing Building in an Interior



ARUP

How daylight varies with the separation distances between buildings.

Architects and lighting designers use BRE tables and 'pepperpot' diagrams to calculate daylight distribution in an interior. Florence Lee took a closer look at the effect of external obstructions on these calculations in a paper for this year's CIBSE Young Lighter competition.

## Outside influences

The calculation of the external effect is mostly based on the assumption that the luminance of an external obstruction is 20% of the CIE overcast sky that it conceals. In general, the effect of surrounding buildings is ignored.

This is fine for a green field site where buildings are far apart. But in city centres like Hong Kong, direct view of the sky is minimal and direct sky illuminance would be very low. The simple factor of 20% would decrease.

#### Computer modelling

In her paper, Florence Lee called this factor – the ratio of the Externally Reflected Component (ERC) to the Sky Component (SC) concealed, factor m.

Using computer modelling, studies were carried out to illustrate the need for additional

guidelines in daylight factor calculation, especially in city centres where ERCs are to be taken into account. ERC's will vary greatly in different site conditions.

The effect of external obstruction was examined from three points of view:

- the relationship between the composite of the total daylight factor and the separation distances between buildings;

- the relationship between factor m and the angle subtended by the 'roof-line' of the obstructing building, as seen from a reference point in an interior;

- the non-green field site effect.

This phenomenon was modelled by varying  $\theta$  – the obstructing angle subtended by the 'roof-line' of the obstructing building, as seen from the reference point.

The model used for simulating

the interior was represented by an area 5m x 5m with a ceiling height of 3m. The window head was 2.25m above the reference plane.

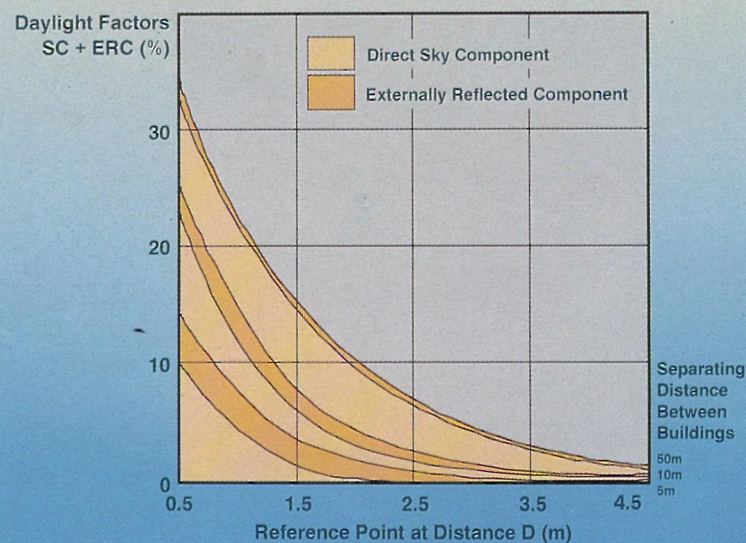
The reference plane and the window sill were at the same height – 0.75m – above the floor. The obstructing building was represented by a rectangular block of 15m x 5m x 15m height. Surface reflectance was 30% and the reference points were taken at 1m intervals along the centre of the room.

#### Results

Figure 1 shows how the daylight contribution varies with the separation distances between buildings, for different reference points along the centre of the room.

Point A is nearest the window and point E the furthest. The obstruction effect is much more

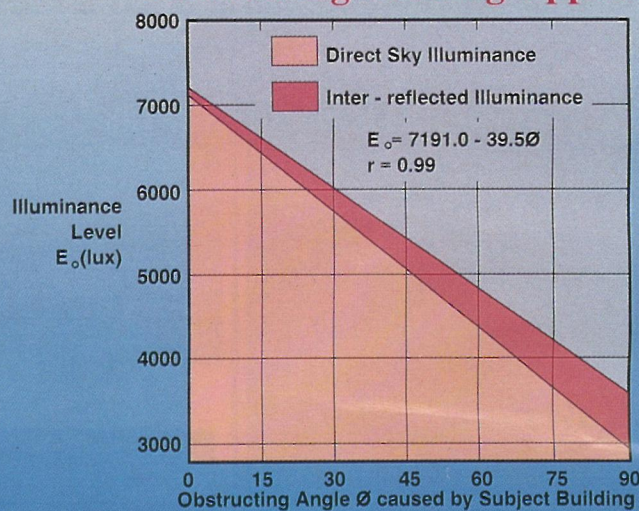
### Daylight Distribution in an Interior



ARUP

How daylight is distributed in an interior.

### Daylight Obstruction Effects of the Subject Building on the Illuminance Level, $E_o$ , at the Surface of the Obstructing Building Opposite



ADUD

distinctive close to the window.

The curves follow the law of diminishing returns and each approaches a maximum value of daylight factor which would occur in a true green field condition.

In Figure 2 the dark shaded area represents the externally reflected component of the total daylight penetration. In general the daylight factor decreases exponentially towards the back of the room.

The study found that the relative proportion of the ERC to the total daylight factor was larger

when the buildings were close together and when the reference point was close to the window.

The effect of the external obstruction becomes less significant towards the back of the room.

Florence Lee proposed two models to describe the relationship between the factor m and the angle  $\theta$  – the angle of obstruction subtended by the 'roofline' of the obstructing building as seen from the reference point.

Factor m was expressed in terms of  $\theta$  and the tangent of  $\theta$ . Both models indicated a logarithmic relationship between m and the angle of obstruction. This variation can be explained by the way the sky luminance pattern varies across the sky vault.

As  $\theta$  varies, so does the ratio of ERC to the concealed sky component.

The results of this analysis indicates that factor m varies in a ratio of 3:1 from zenith to horizon, correlating very closely with the 3:1 ratio of sky luminance variation from zenith to horizon across the sky vault of the CIE overcast sky.

In the final analysis, subject buildings of different heights were used.

Figure 3 shows how the illuminance,  $E_o$ , of the obstructing building varies with different degrees of obstruction, created by the subject building. With the angle  $\theta$  exceeding 60°,  $E_o$  can reduce by up to 30% when compared with a green field site value.

Factor m should be directly proportional to the luminance of the external obstruction and this luminance, in turn, directly proportional to the illuminance it receives. We would expect factor m to vary with angle  $\theta$  in a similar way. Further corrections, therefore, should be made to m if the density of buildings on the site is high.

How the illuminance of the obstructing building varies because of obstruction caused by the subject building.

#### Conclusions

Florence Lee concluded that we need to consider 'm' as variable rather than as a constant of 0.2, due to the variation of sky luminance pattern across the sky vault.

In addition, a further reduction will be expected in a densely packed city centre.

The author found the ratio of ERC to the sky component concealed would vary from 0.2 when the reference points were close to the window, the site was densely packed with tall buildings, exceeding 30m or 8-storeys, and the separation distance between these buildings was less than 20 m.

#### Further work

In a high density site, factor m will need further corrections due to the lower direct sky illuminance incident on the buildings. Its final value should allow the true ratio of ERC to SC concealed to be used in conjunction with the current Daylight Factor calculation methods.

From what the author has seen in Hong Kong and many other city centres, fully glazed facades will continue to be widely used in the 90s. Where land is scarce and expensive, high rise buildings in close proximity with each other are inevitable.

She suggests that for daylight studies on buildings in high rise city centre areas, a more rigorous method of calculating ERC was required to prevent over-optimistic results.

Florence Lee hopes her paper will be a starting point for further study.

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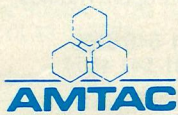
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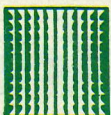


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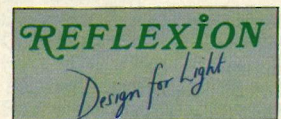
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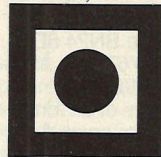
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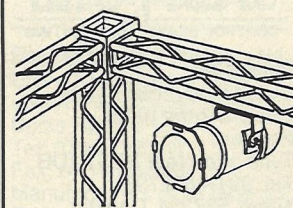
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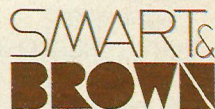
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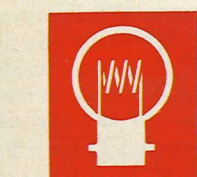
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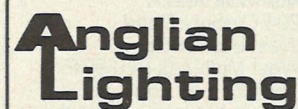
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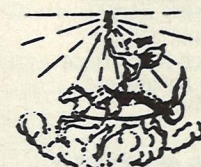
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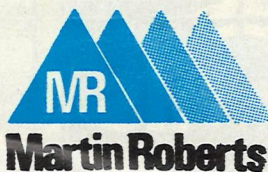
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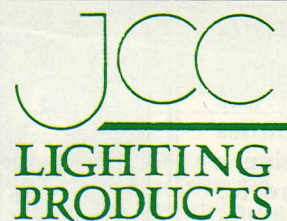
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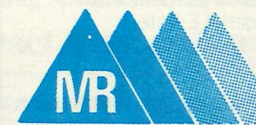
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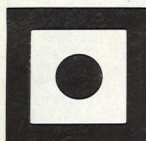
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### CATALOGUE DIRECTORY

Every year companies spend huge amounts of time developing catalogues and one of the biggest problems they face is publicising and distributing them to specifiers. If you have a catalogue, printed or in production, which is targeted at lighting specifiers then this section can help you.

**Contact Alastair Moyes on 081-975 9759**

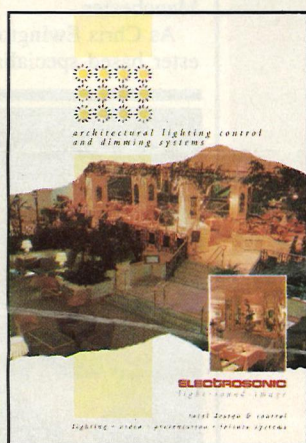
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## CATALOGUE DIRECTORY

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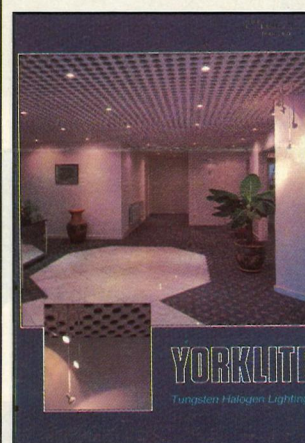
Acorn Lighting are pleased to announce that the BJC product range has been added to their portfolio of products. BJC offer a range that includes street & amenity lighting, industrial lighting, floodlighting & lighting for security. The whole product range is manufactured to the highest quality standards: circle 90



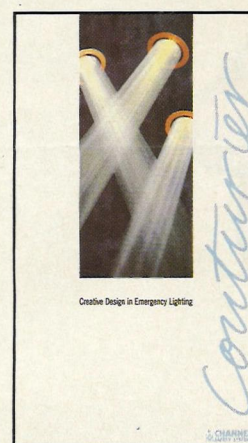
Whatever the application, from hotel to museum, shopping complex to a church, Electrosonic's range of architectural lighting control and dimming systems can meet your requirements. Electrosonic's expertise is world renowned, with over 25 years' experience. From a single channel dimmer up to a custom-built computer controlled network, Electrosonic is there: circle 91



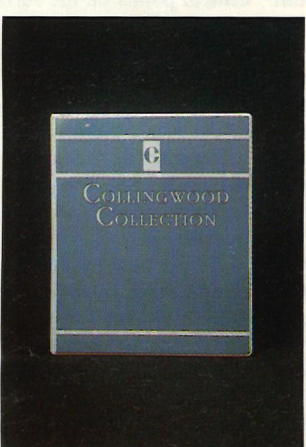
Catalogue Update  
Introduced by JSB Electrical is a range of prestige luminaires which includes the new Carina with crystal glass and a brass body. It is available as an emergency luminaire in maintained, non-maintained and slave options with a matching mains version. All are available with a choice of surface or semi-recessed mounting: circle 92



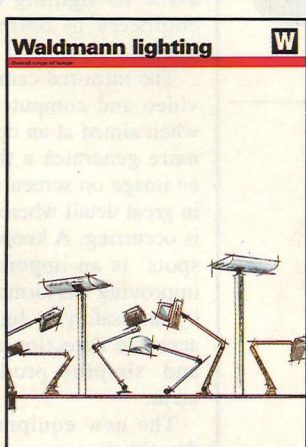
A new brochure from Yorklite illustrating an extensive range of Tungsten Halogen lighting for open cell as well as plain ceilings. Also featured is the unique plug-in Gridline transformer system approved for use with Armstrong 15mm and 24mm Turlok grid suspension systems. Special luminaires also manufactured: circle 93



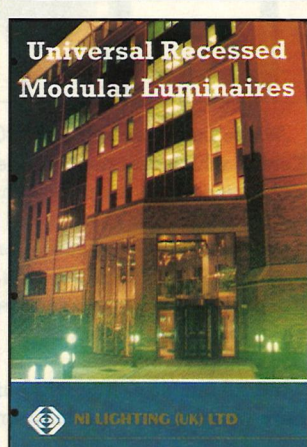
Channel Safety Systems Ltd announce the launch of 'Couturier', a new concept in emergency lighting for the nineties. An innovative range of emergency luminaires designed to present an opportunity to break away from the stolid conventions of the past and apply refreshing creativity to this sector of the market: circle 94



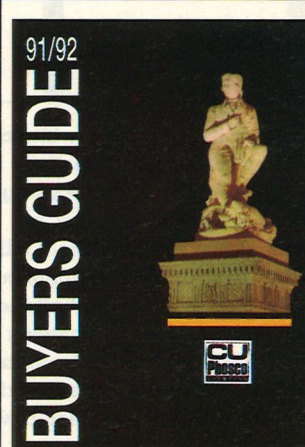
This new detailed and extensive catalogue from Collingwood illustrates many hundreds of components and accessories for use in building decorative luminaires. Product information includes dimensions, materials, temperature wattage and voltage ratings, approvals, interchangeability and compatibility: circle 95



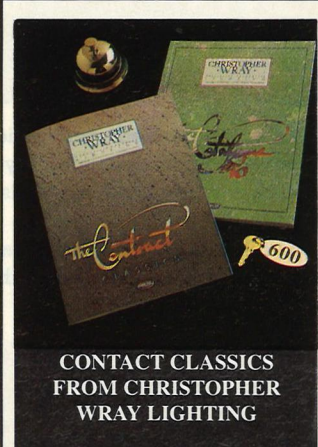
Midland Machinery Services have published a new 68 page catalogue showing the range of Waldmann Industrial Lighting. The catalogue shows the various office and industrial applications, most of which are available in various voltages and frequencies and with sealing up to IP67. A full range of accessories is also shown in the full colour publication: circle 96



N.I. Lighting's new brochure for the Universal Range of recessed modular luminaires. The Universal luminaire can be installed in 95% of ceiling systems, with attachments including parabolic low brightness louvres, Wedge VDU and white louvres, prismatic lens, opal diffusers, and custom built attachments: circle 97



CU Phosco Lighting's new 84 pages of ideas for the outdoor environment including, Lanterns, traditional and modern; Columns in steel, aluminium and concrete; High Masts up to 50m; Floodlights up to 2Kw; Bollards; Benches and Litter Bins (Victor Stanley): circle 98

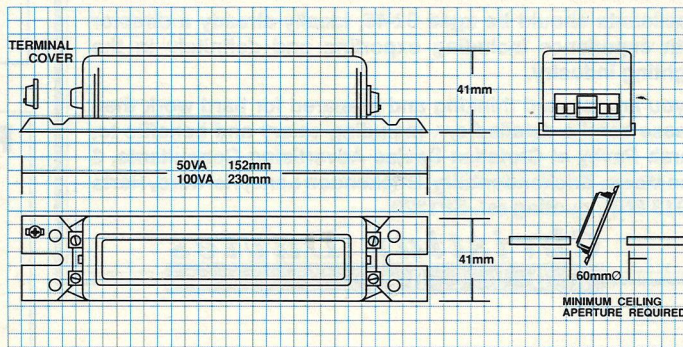


The Contract Classics from Christopher Wray Lighting is a 64-page full colour supplement to the company's Catalogue Number 10 especially designed for the contract market. With full technical information and advice on energy saving systems, The Contract Classics highlights the enhanced service Christopher Wray Lighting offers from each of thirteen outlets: circle 99



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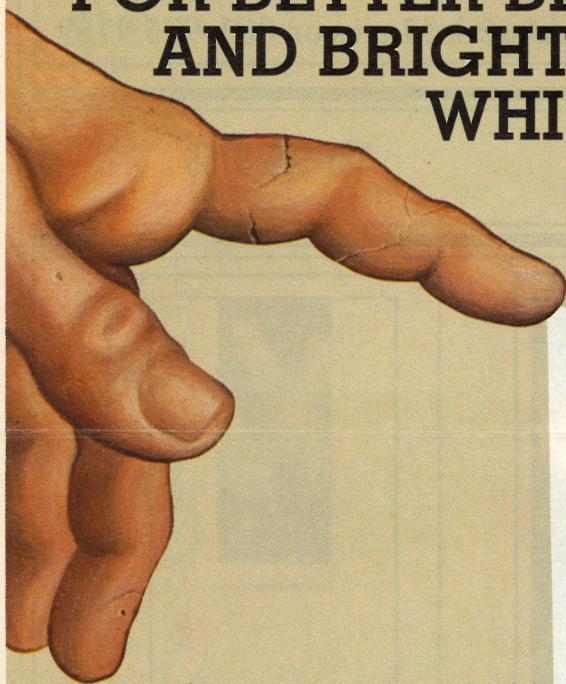


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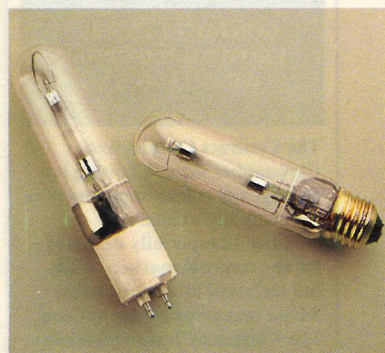
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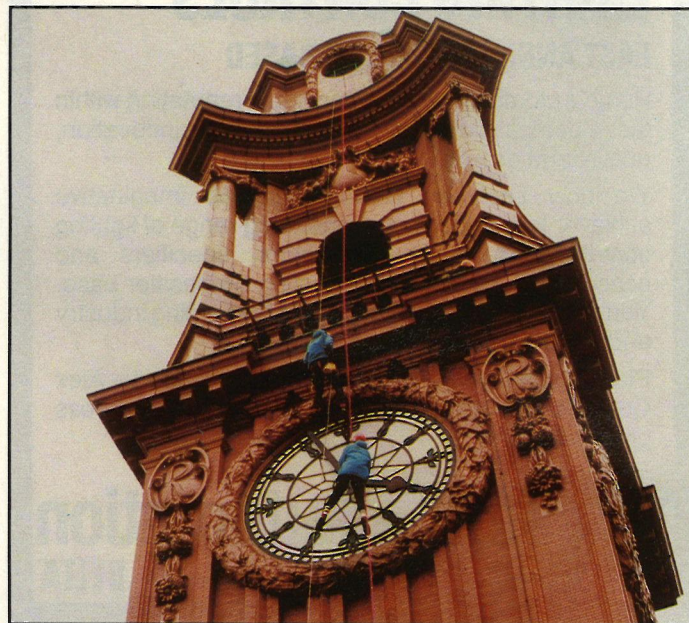


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## LIGHTING EQUIPMENT NEWS



### Northern high lights

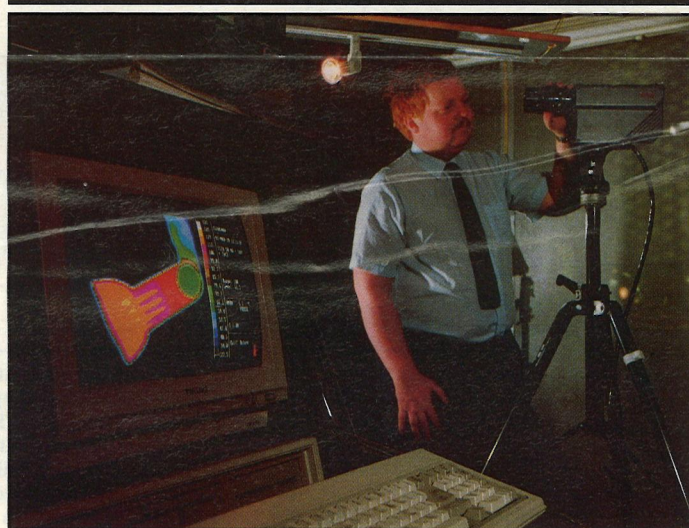
Heard the one about the abseiling lighting specialists? It's not a joke. Seven qualified electricians - who also happen to be experienced rock climbers and abseilers - have been putting the finishing touches to exterior floodlighting of the refurbished Refuge Assurance headquarters buildings in Oxford Street, Manchester.

They have been using their abseiling skills to attach lights in 16 different colours to the building's 66 metre high clock tower, a landmark in city centre Manchester.

As Chris Ewington, of Manchester based specialist contractors

Complete Design Expertise explained: "It is not possible to complete the upper reaches of the tower with scaffolding, hence the need to employ experienced abseilers to install the highest lights. They are all operating under the most stringent of safety measures but nevertheless it is an awesome task."

The floodlighting of this prominent Manchester building is being funded by a £60 000 grant from Central Manchester Development Corporation, which is also paying half of the £200 000 cost of cleaning the terracotta facades and repairing decorative stonework.



### Camera acts as design aid

A thermal imaging camera has been commissioned by Thorn to assist its lighting development engineers to optimise product design.

The infra-red camera, linked to video and computer equipment, when aimed at an operating luminaire generates a thermogram - an image on screen which reveals in great detail where heat-built up is occurring. A knowledge of 'hot spots' is an important factor in improving performance, reliability and safety of light fittings, so accurate detection can speed up and simplify product development.

The new equipment replaces the old time consuming and trial and error method of testing where

numerous heat detectors, or thermocouples, were placed at critical points on the surfaces of a luminaire.

The trend towards smaller fittings made it difficult to position thermocouples. And siting even the smallest thermocouple within a low profile track system was difficult. So, the accuracy of testing could sometimes be questioned.

As the new system 'reads' the temperature by external means, there is no need to interfere with the fitting to obtain an accurate thermal picture. In addition, it provides important information about heat patterns surrounding luminaires which thermo-couples cannot give.

### IN YOUR NEXT ISSUE

Lighting controls can improve the flexibility and convenience of any major lighting installation. Modern controls also make the most of today's high technology light sources. In the July issue of

Lighting Equipment News we will be concentrating on this area of the lighting sector and examining some recent schemes which have been adjudged winners of the prestigious EMILAS Awards.



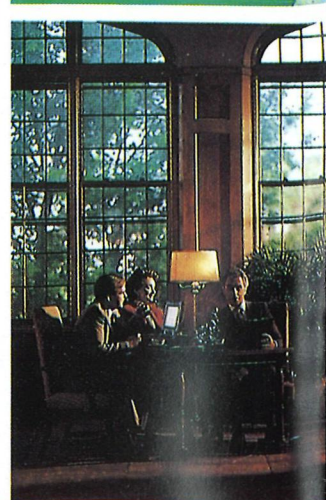
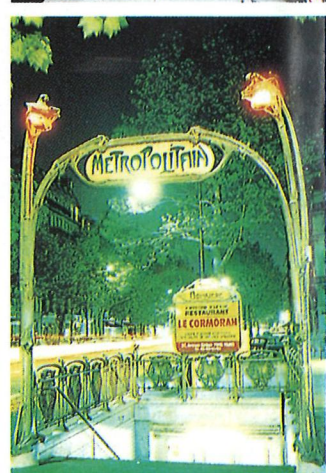
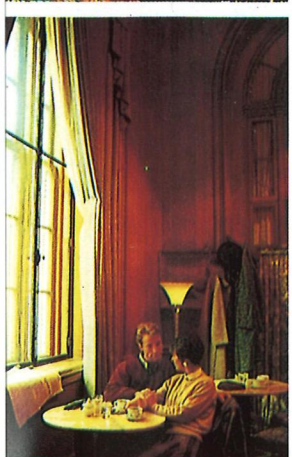
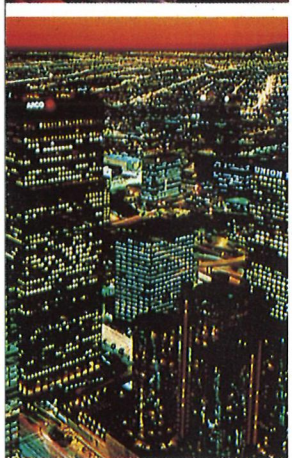
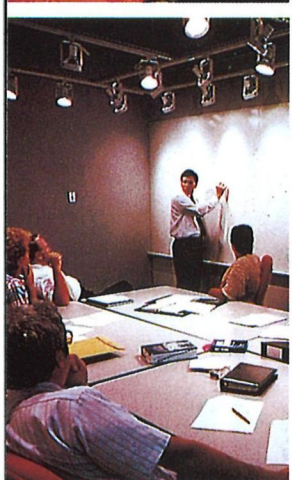
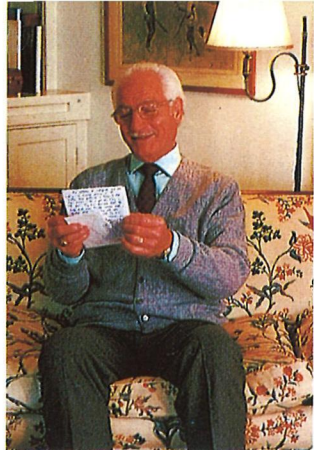
# Decorative Lighting



## Buyers' Guide 1991/92

- Looking to the future
- Sell by example
- Seeing the light



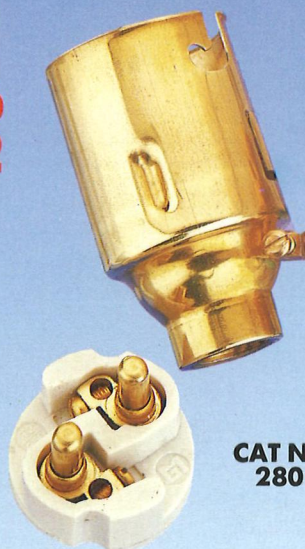


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# Decorative Lighting Buyers' Guide 1991/92

Front cover: The Hilton National Hotel at Newbury sets an elegant period interior, featuring a large collection of reproduction paintings by the Regency artist George Stubbs, in a modern open plan setting. Eighteen-light Louis XV ormolu chandeliers by Chelsom in weathered bronze finish are set in octagonal ceiling recesses in the reception area and lounge. These are supplemented by low voltage spotlights recessed into the ceiling.



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## HOW TO USE THIS GUIDE

First refer to pages 19-28 and locate the type of luminaire in which you are interested under the headings Traditional or Modern. Then in the vertical list of materials on the left hand side of each page find the structural material of the luminaire that you require. By reading down and across the page from these headings you can then locate the key numbers of the manufacturers who produce these fittings. The key numbers are listed in numerical order against the alphabetical list of all members on pages 9-17.

This listing has been compiled on the basis of information supplied to Lighting Equipment News by DLA member companies as at 1 June 1991. For further information on the decorative lighting industry contact the Decorative Lighting Association, Bryn, Bishops Castle, Shropshire SY9 5LE. Telephone: 058 84658.

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**Associate Editor:** Barbara Trigg

**Art Editor:** Lorna Francis

**Advertisement Manager:** Jim Hughes

**Northern Area Manager:** Robert Ditchfield

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R W Osborne, (Chairman)

G J F Brigg (Managing Director)

N C G Foster, D L Jones, D B Wright



Maclean Hunter Ltd, Maclean Hunter House, Chalk Lane,

Cockfosters Road, Barnet, Hertfordshire EN4 0BU

Telephone: 081-975 9759 Facsimile: 081-975 9753

Telex: 299072 MACHUN G. Midlands,

Northern Area Office, Tel: Cannock (05435) 72771

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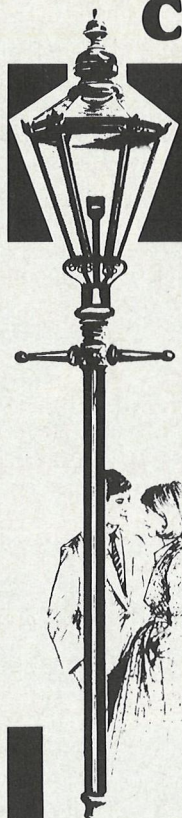
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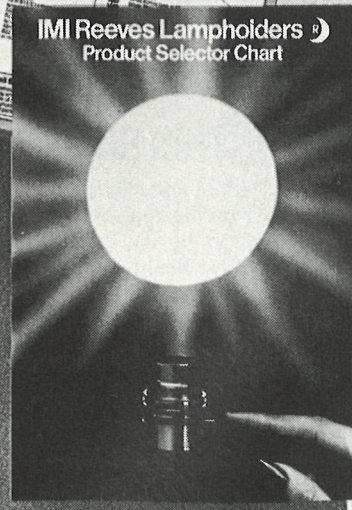
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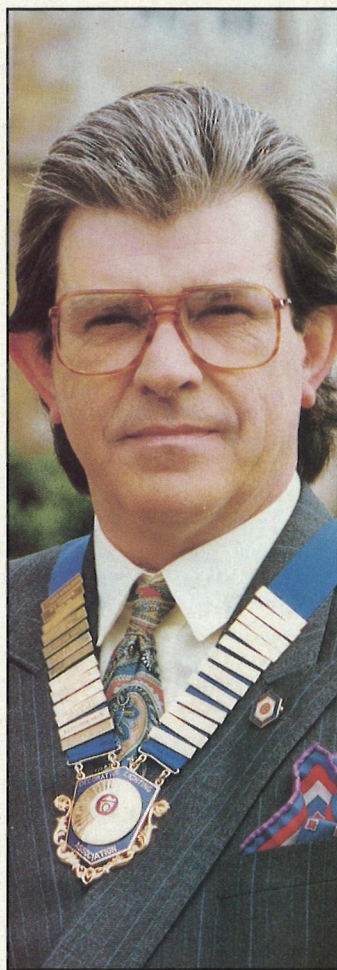


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DLA Buyers Guide 1991/92



# President's message: Looking to the future



**This year's DLA President, Keven Verdun.**

**T**here has never been a time of more importance and opportunity for the Decorative Lighting Association and those connected with it.

Recent months have seen impressive strides in our involvement with other trade bodies throughout Europe, with the end views of strengthening our commitment to single market trading, broadening our membership and improving our overall effectiveness.

We have reached a good level of mutual co-operation with the Lighting Industry Federation, and this is showing a number of benefits already. Most tangibly, LIF and DLA members will receive the same concessions on stand space at the expanded Lightshow '92 which takes place at Earls Court 2 from 26-29 January 1991. LIF are lending their active backing to the exhibition.

This is completely in line with our joint intention to develop Lightshow into an exhibition for the whole of the lighting industry, from component suppliers through to luminaire manufacturers and complete lighting systems houses.

The Lightshow can and will take in decorative, contract and commercial exhibitors, to offer buyers a complete overview of the industry through one event. Indeed, there is already much evidence that the types of lighting traditionally viewed as either completely decorative, or completely contract, are increasingly crossing over. Low energy and low voltage light sources have much to do with this.

The increasingly rich mix of

exhibitors will expose visitors to an ever-broadening range of ideas and products, and this is surely what the best exhibitions are all about. The Decorative Lighting Association believes that Lightshow has the potential to become one of European lighting's most important exhibitions, alongside Hanvoer, Milan and Paris. We intend to ensure it happens.

Present trading conditions aside, capturing the attentions of Britain's commercial, contract and retail lighting buyers is viewed as an attractive plum by many mainland European lighting suppliers and there will be increasing numbers of them at Lightshow.

While this may be seen as a threat by US-based suppliers, it must be seen as an opportunity to look at new ideas, influences and products by UK-based buyers.

It is unlikely that European firms will affect suppliers who produce the sort of traditional lighting that will only ever sell to retail shops in this country. They are likely to retain this niche market without a fight since, in European terms, it is too specialised for incoming competitors to crack.

As in the rest of Europe, the main battle will be for mass-appeal sales and for the lucrative professional and contract markets. UK companies must defend their patches through technical and design innovation, effective communications with buyers and competitive pricing, and use the same tools to address the wide-open European markets.

A further significant development in European terms has been the prominent role played by the

Association within CELMA, the Committee of European Luminaire Manufacturers' Associations. Indeed, the Lighting Industry Federation will hold the presidency of CELMA in 1992, with the Decorative Lighting Association running the secretariat.

Within the European Economic Community, CELMA constitutes a potentially powerful lobby to advance the overall cause of lighting to relevant markets and Government bodies. As the momentum increases to abandon national safety standards and substitute them with EC-wide guidance, it is essential that we play an active role, in the best interests of our members and their buyer customers.

Short of products made by companies with BS5750 quality registration, we believe that suppliers registered under the DLA's own Code of Practice have much to offer buyers both in the UK and in other Community countries in terms of quality standards.

The DLA is constantly seeking to encourage suppliers to take up the Code, since it represents a tremendous assurance of manufac-

turing quality. We have recently introduced a number of new measures and objectives to develop the Code, including:

- supplying Code participants with standardised record-keeping forms;
- appointing a Technical Safety Officer and installing appropriate computer systems to give more support to Code members;
- Increasing the Code's policing through spot checks;
- Speeding type testing approvals through making wider use of NAMAS-approved test houses;
- supplying test equipment to Code members at competitive rates.

CELMA will play a vital role in advising on standards, and in halting the flow of unsafe rogue lighting products into any European country. We want British companies to be in the vanguard of CELMA's safety drive.

Outside the EEC, we believe that CELMA can be of enormous benefit to lighting companies affiliated to any of its member trade bodies. As a pan-European corporate body, it is a uniquely powerful tool to help its members develop overseas markets. Increasingly, the affluent economic world is being viewed as three key trade blocs: Europe, of which we are a part; North America; and the Pacific rim, including Japan.

The job of CELMA and the DLA is to advise and encourage our members to grow more adventurous, mounting trade delegations to allow them to expand from home base by forming trading agreements in the other two key trading areas.

CELMA itself must develop more fully before this can happen, but the DLA sees this as an essential aid to its members. It will also benefit the UK buyer, because our companies are likely to find that the most effective way of plying their goods overseas is to link with a partner company on some sort of reciprocal trading arrangement.

The Decorative Lighting Association is undergoing unprecedented change. In doing so, it will continue to develop its reference base for and services to buyers from the architectural, interior design and retail sectors.

If you require information that you cannot find in this Guide, please do not hesitate to telephone our full-time staff at our head office on 058-84 658.

**KEVEN VERDUN**  
President, DLA



**Good lighting is essential to successful electrical retailing, argues lighting consultant *Gerry Brown*. Retailers who sell lighting equipment inspire customer confidence when they use the very products they sell effectively.**

# Sell by example

**P**rofessional retailers know how essential it is to display their merchandise in a visually attractive manner — not only in display windows by also throughout the sales area of the store.

The importance of good lighting in achieving this objective is recognised by Rule No. 7 of the "Visual Merchandising Rules" which states:

Present the merchandise in a good and appropriate light because:

- ☐ light provides extra visual impact and observation of the other visual merchandising rules is strengthened;
- ☐ light adds that magic ingredient to the presentation;
- ☐ good lighting can help to set the style, image and character of the shop;
- ☐ good lighting can improve sales and profits;
- ☐ customers have 'lazy eyes' — so help them to see what they need to look at.

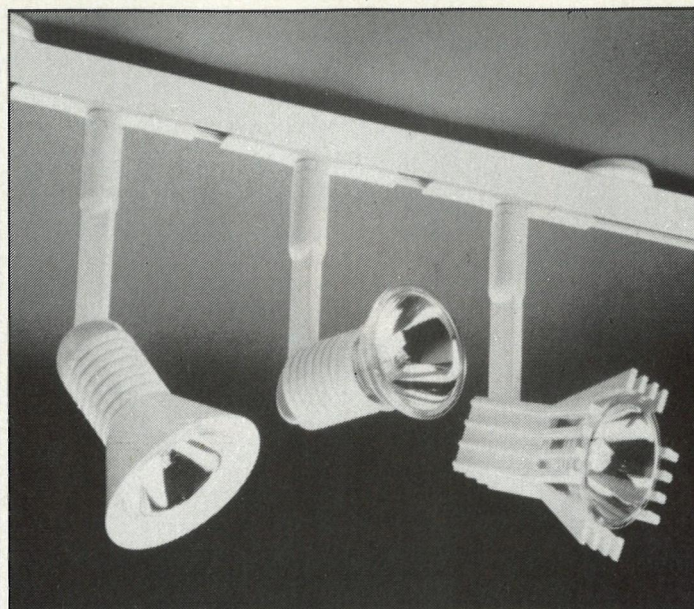
Today's vast range of equipment, suitable for retail store lighting — and who can forecast what new developments will be introduced tomorrow — often causes some confusion which is easily reflected in the effectiveness, or more usually ineffectiveness, of the resultant lighting installation.

The first objective when designing a good lighting scheme for a retail store is to determine the key lighting criteria relating to the type of merchandise, its price/quality, merchandising method and the required store image.

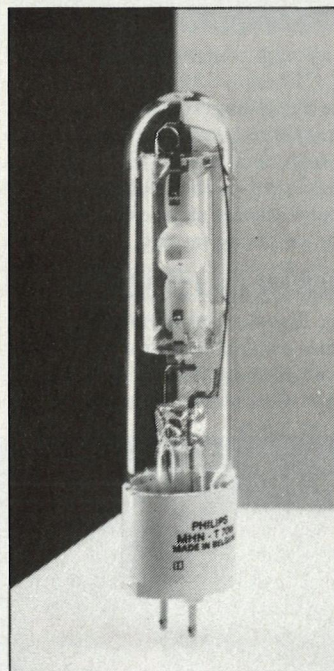
For example, if the method of merchandising is like that of a supermarket, with high density displays of products goods on shelves, then the general lighting level, usually provided by ceiling mounted luminaires, should be of a fairly high value — say 500 to 1000 lux with good uniformity. On the other hand, if the retailer is selling high value, possibly exclusive, merchandise with a high degree of customer service — a high quality jeweller, for instance, or major fashion house — then it is more appropriate to have a very low level of general lighting and apply effective display lighting to create visual interest within the interior generally as well as on low density merchandise displays.

These are the extremes of the types of visual environment in retail stores. The first encourages shoppers to inspect and self-select products with minimal customer service while the latter, with its more relaxed 'social' atmosphere, requires the merchandise to have a high price/profit margin to afford the high level of customer service.

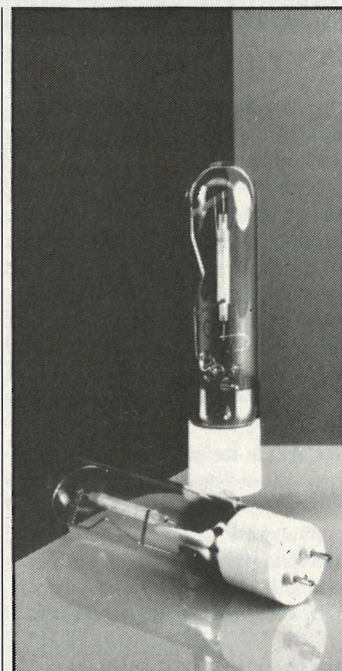
The lighting requirements of the vast majority of electrical retailers and departments occupy the 'middle ground' but problems arise from the wide range of types, sizes and styles of merchandise coupled with the varying degree of customer service required. A customer will happily select a 100W light bulb from a dispenser and pay for it at the cash desk, but is unlikely to adopt such a procedure for the higher priced, more economical, 20W compact fluorescent lamp unless a



Low voltage track with Philips fittings for dichroic reflector lamps.



White SON (SDW-T) comes in 35W, 50W and 100W ratings.



Single ended metal halide lamps (70W and 150W).

combination of point-of-sales material, display lighting and, possibly, some advice from the sales person encourages him to do so. The same comments apply with even greater force to complex purchases such as video recorders.

The visual effectiveness of display lighting is dependent upon:

- ☐ the amount of general lighting
- ☐ the intensities (strength) and beam patterns of the display lamps/luminaires,
- ☐ the manner in which the display lighting is applied.

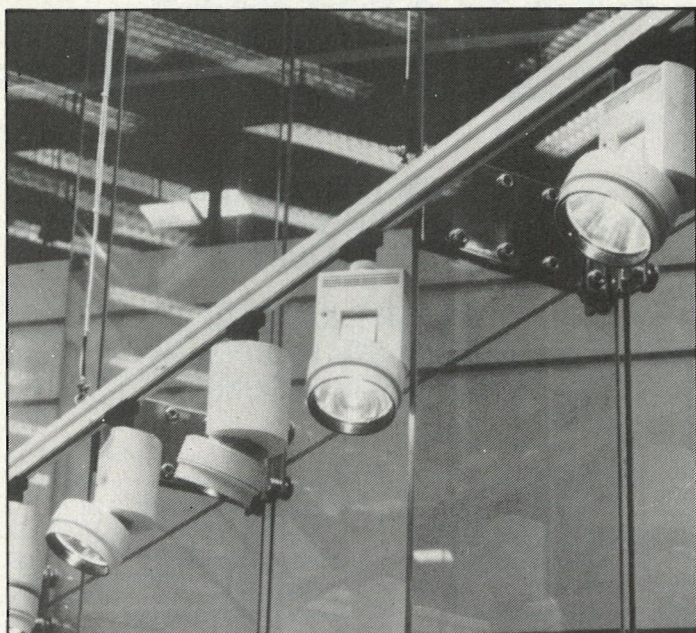
Obviously the degree of visual emphasis created by a given arrangement of display lighting is

greater if the general lighting level is reduced. Similarly, the higher the illuminance provided by the general lighting the greater are the required intensities — and, therefore, wattages — of the display lighting lamp to provide the same degree of visual emphasis. The latter approach significantly increases the electricity cost and it is, therefore, more economical to have a general lighting level of say 300 lux.

There may, of course, be trading periods when a higher or lower general lighting level is desirable, in which case the general lighting installation should be designed to provide 500 lux which can be reduced, by switching or regulation,



## SHOP LIGHTING



Philips' track mounted adjustable spotlights, with integral control gear for White SON lamps.



One of the new generation of improved performance low voltage dichroic reflector lamps.

The vast majority of compact fluorescent lamps currently available have good colour rendering properties and a 'warm' colour appearance (2700 — 3000K) which is ideal for domestic applications. Here again, the lighting retailer can easily demonstrate their suitability by using them in any downlight luminaire which is part of the store lighting, as well as in some of the lighting fittings on display.

The usual method of displaying lighting merchandise — by using the entire ceiling to suspend single and multi-point pendant fittings and covering the walls with wall mounted fittings of one sort or another — creates problems. When most, or all, of them are lit there is no need for the fixed lighting installation to provide a general lighting component and, arguably, the resultant illuminance will be such that it is difficult to create any significant visual emphasis on unlit merchandise with display lighting.

Displaying lighting fittings in this manner certainly fulfils one of the customers' requirements as they can see the style, colour and so on of the items offered. But it does not help them to appreciate the lighting effect that results from their use, which is at least as important as the appearance of the fitting itself. Admittedly it is difficult for the retailer to arrange a display of lighting fittings that permits the lighting effects to be demonstrated without reducing the number of items on display.

Part of the showroom could be allocated to simulate, an interior and fitted with a few representative lighting fittings — pendant, downlight, uplight, spotlight fittings — so that the different lighting effects can be demonstrated to customers.

Spotlights have a significant role in display lighting and the introduction a few years ago of small low-voltage tungsten halogen reflector lamps provided much more scope to achieve dramatic visual effects without having to use bulky display fittings housing lamps such as the PAR 38 range. Initially the small halogen reflector lamps were only available with an aluminium reflector which reflects infra-red radiation (ie heat) as well as light. Subsequent developments led to the use of dichroic reflectors which, by allowing the infra-red to pass through, reduce the amount of heat in the beam. Note that dichroic lamps must only be used in luminaires which are specifically designed to accommodate them.

Improvements in the inherent and optical efficiencies of dichroic

reflector lamps have resulted in a third generation of lamps typified by the Philips Masterline range. Performance of these new lamps is between 20% and 70% better than the previous generation and they provide users with the option of better performance for the same wattage or the same performance for a lower wattage.

A common mistake when lighting for display effects is to use lamps with too low a beam intensity. This may be because the lamp wattage is too low or the beam angle is too wide.

These small dichroic reflector lamps can be used in appropriate low voltage track systems as well as individual luminaires and not just for display lighting but for 'effect' lighting in interiors. What better way of developing sales of such items than by using them in the retail store in ways which demonstrate their potential for home use.

The major problem when lighting display windows is the need to overcome daylight, especially if the windows are north facing and reflect the bright images of the south facing facades immediately opposite. Obviously this situation does not apply when the store is in an enclosed shopping mall. While fluorescent lighting can be used to achieve the high illuminance required in the windows it is difficult to position them so that they project sufficient light on to the vertical surfaces of the displayed merchandise. A better solution is to use some of the newer forms of discharge lamps, such as white SON and metal halide, which have been specifically designed for such applications.

Although such lamps, their associated control gear and luminaires are more costly than tungsten halogen they are more efficient, producing lower electricity costs, and the lamps last longer. They also provide higher lumen packages which means less lamps and luminaires for a given lighting result. A range of luminaires is now available for white SON and metal halide lamps and, in addition to window display lighting, they are also ideal for the display lighting of large items of merchandise or areas within the body of the store.

Retailers who sell lighting equipment should not only ensure that they sell the best lighting solutions to their customers. They also need to exhibit their expertise by using some of the products, especially the new light sources, within the store lighting in a manner which illustrates their effectiveness. In short practice what you preach.

to those lower values which may be required.

In most instances the general illuminance will be provided by fluorescent lighting and the retailer should ensure that the types of lamps used have the right colour characteristics. Electrical retail outlets should use 'warm' colour appearance lamps (correlated colour temperature around 3000K) with good colour rendering. Such requirements are best met by the tri-phosphor lamps, including Philips Colour 83 and Thorn Polylux 3000, which combine good colour characteristics with high efficacy. The older colours of fluorescent lamps — White, Warm

White and Cool White — are not only less efficient, but also relatively poor in terms of their colour rendering.

How many electrical retailers sell fluorescent lamps to the general public and what colours do they stock and sell? Many domestic lighting users have been dissuaded from using fluorescent lighting in their homes because of the colour distortion of food, furnishings and their complexion that results from using unsuitable lamps. It is, therefore, good business practice for the retailer to use the right colour of lamps for store lighting as well as stocking, recommending and selling them to the general public.



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For more information contact:

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## RETAILER TRAINING SCHEME

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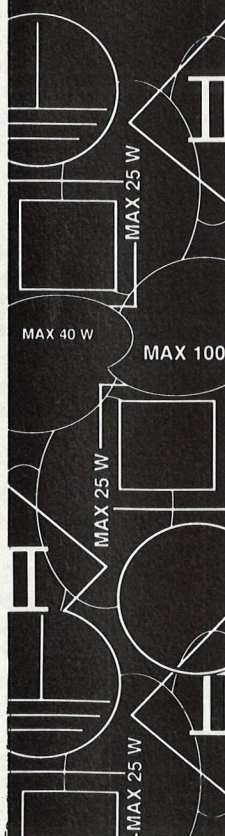
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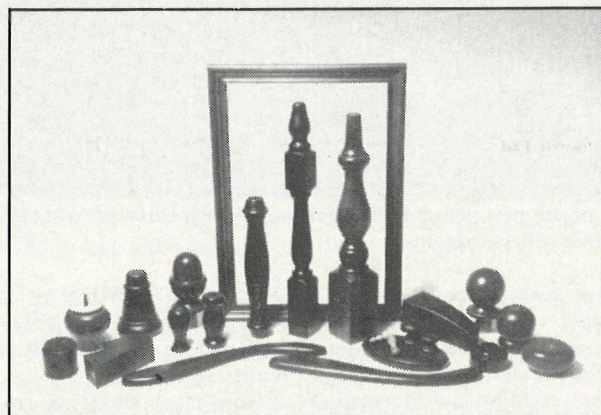
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- 16 **Astral International Ltd**  
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- 25 **Peter Baker Leaded Glass  
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- 54 **Caprani Light**  
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- 55 **Carlsen Lighting**  
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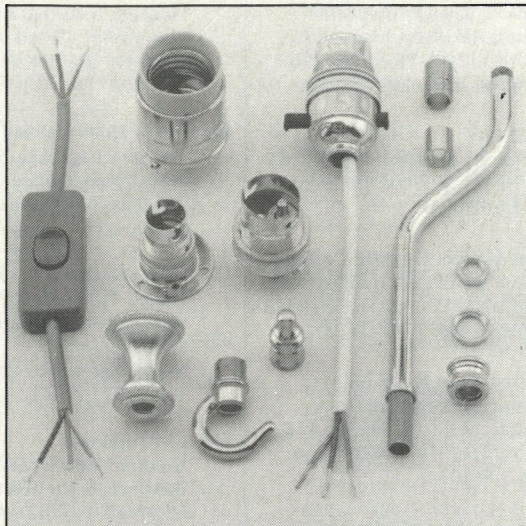


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| <p><b>57 Caroline Shades</b><br/>134 Grange Road, Gillingham,<br/>Kent ME7 2QS. Tel: 0634<br/>50387.</p>   | <p><b>70 A E Clutterbuck Ltd</b><br/>Cranmore Drive, Shirley<br/>Trading Estate, Solihull, West<br/>Midlands B90 4SD. Tel: 021-<br/>704 3134. Fax: 021-704 3421.</p>                                  | <p><b>84 Martin Dannell &amp; Co Ltd</b><br/>Grosvenor Works, Mount<br/>Pleasant Hill, London E5 9NE.<br/>Tel: 081-806 8662. Fax: 081-<br/>806 7180.</p>                                   | <p><b>98 Dernier &amp; Hamlyn Ltd<br/>(Montrose International)</b><br/>47/48 Berners Street, London<br/>W1P 3AD. Tel: 071-580 5316.<br/>Fax: 071-636 0243.</p>                                    |
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| <p><b>65 Chelsom Ltd</b><br/>Heritage House, Clifton Road,<br/>Blackpool FY4 4QA. Tel: 0253<br/>791344. Fax: 0253 791341.</p>  | <p><b>78 Harry Cowan (Electrical) Ltd</b><br/>15 Broughton Street,<br/>Manchester M8 8LZ. Tel: 061-<br/>832 7584. Fax: 061-834 7854.</p>  | <p><b>92 Decorlight</b><br/>146 Wellesley Road, Clacton on<br/>Sea, Essex CO15 3QD. Tel:<br/>0255 421818.</p>  | <p><b>106 Econ Industries Inc UK</b><br/>Unit 2, Anglesey Business Park,<br/>Littleworth Road, Hednesford,<br/>Cannock, Staffordshire WS12<br/>5NR. Tel: 0543 425253. Fax:<br/>0543 422476.</p>   |
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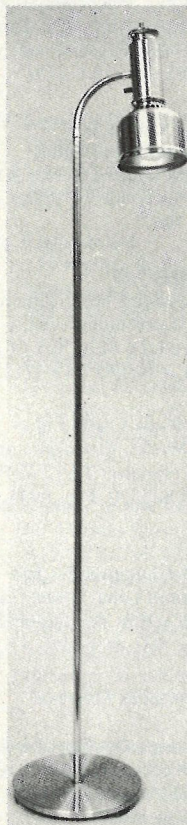
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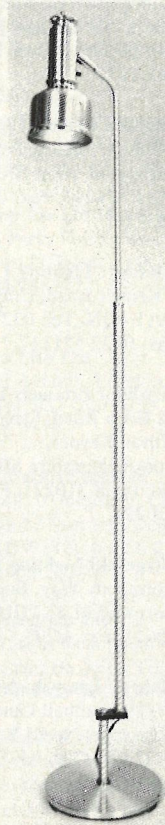


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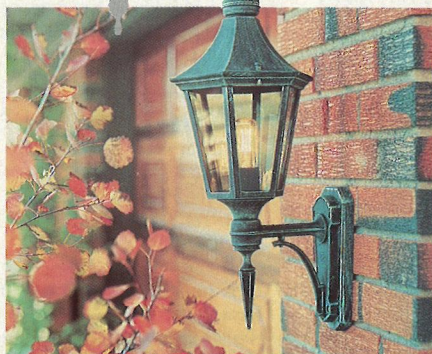
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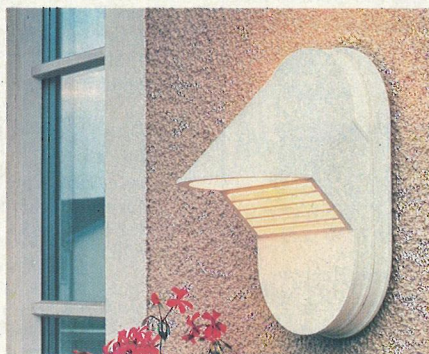


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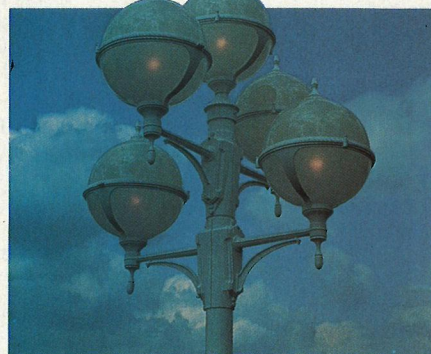
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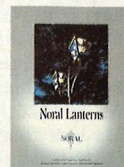
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- 112 Fantastic Lighting Ltd**  
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- 113 Firstlight Products Ltd**  
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- 114 Fitzgerald Lighting Ltd**  
Normandy Way, Bodmin, Cornwall PL31 1HH. Tel: 0208 75611. Fax: 0208 74893.
- 115 Flairlite Lampshades Ltd**  
27/29 Leadhall Lane, Harrogate, North Yorkshire HG2 9NJ. Tel: 0423 872051. Fax: 0423 871487.
- 116 Flos Ltd**  
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- 117 Focus Lighting Ltd**  
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- 118 Forma Lighting Ltd**  
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- 119 Fowler Pottery**  
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- 120 Frandsen Belysning ApS**  
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- 121 Franklite Ltd**  
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- 122 Ian Fraser Lighting Ltd**  
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- 123 Furniture Industry Research Association**  
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- 124 G B Lighting Ltd**  
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- 131 J A Green & Sons Ltd**  
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- 132 Green Tree Lighting**  
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- 133 Gregory's Ltd**  
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- 134 Griffin Lighting**  
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- 135 H L S Ltd**  
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- 136 James Hackett (Ireland) Ltd**  
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- 138 Hadrian International Ltd**  
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- 139 Hal-Lite**  
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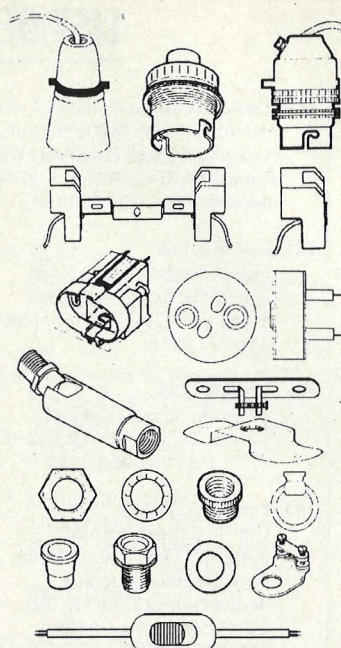


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Unit 7C, Whitebridge Industrial Estate, Whitebridge Lane, Stone, Staffordshire ST15 8LQ. Tel: 0785 818626. Fax: 0785 812114.
- 288 Scan Decor trading as Scan Lighting (Inlite Group)**  
Hawtin Park, Pontllanfraith, Blackwood, Gwent NP2 2EU. Tel: 0443 862121. Fax: 0443 816763.
- 289 Surrency Shades**  
51 Market Hill, Maldon, Essex CM9 7QA. Tel: 0621 855519.
- 290 Searchlight Electric Ltd**  
Searchlight Trading Estate, Water Street, Manchester M3 4JU. Tel: 061-834 5451. Fax: 061-832 0316.
- 291 J Segal (Electrical) Co Ltd**  
Unit F, Harbet Road, Lea Valley Trading Estate, Edmonton London N18 3LD. Tel: 081-884 3458. Fax: 081-884 3634.
- 292 Stephen Selby Pictures Ltd**  
53/65 Broadway Market, London E8 4PH. Tel: 071-254 9771.
- 293 Serva Lighting**  
Europa House, Coronation Avenue, Harrogate, North Yorkshire HG2 8BY. Tel: 0423 871785. Fax: 0423 879736
- 294 Shades of Glasgow**  
91 McPhail Street, Bridgeton, Glasgow G40 1ND. Tel: 041-551 9850. Fax: 041-554 5005.
- 295 Shelf Pottery Ltd**  
Denholme Gate Road, Hipperholme, Halifax, West Yorkshire HX3 8JQ. Tel: 0422 205858.
- 296 Shire Wholesale Furnishings Ltd**  
65 High Street, Colchester, Essex CO1 1DX. Tel: 0206 47163. Fax: 0206 47163.
- 297 The Silk-Gate Collection**  
Foundation Units — No 5, Westfield Road, Slyfield Industrial Estate, Guildford, Surrey GU1 1RR. Tel: 0483 37752. Fax: 0483 31598.
- 298 Stella Silver**  
12 Gladstone Road, Sheffield S10 3GT. Tel: 0742 301434.
- 299 Simon & Simon (Lampshades) Ltd**  
Fitzwarren Street, Salford M6 5JF. Tel: 061-745 7985. Fax: 061-745 9856.
- 300 Barry R Skinner Lighting**  
Unit 3, Clipstone Brook Industrial Park, Cherry Court Way, Leighton Buzzard, Bedfordshire LU7 8TX. Tel: 0525 850562. Fax: 0525 851623.
- 301 Tony Skinner Oriental Arts**  
Brightwell Industrial Estate, Ferryfield, Norton Road, Newhaven, East Sussex BN9 0JF. Tel: 0273 517000. Fax: 0273 516134.
- 302 Arnold Smart Ltd**  
Gadlys Industrial Estate, Depot Road, Aberdare, Mid Glamorgan CF44 8DL. Tel: 0685 884202. Fax: 0685 811882.
- 303 S Smith (Electrical Fittings) Ltd**  
85 Abercromby Avenue, High Wycombe, Buckinghamshire HP12 3BB. Tel: 0494 21667.
- 304 Smithbrook Ltd**  
Smithbrook, Cranleigh, Surrey GU6 8LH. Tel: 0483 272744. Fax: 0483 267863.
- 305 Sophie International Ltd**  
Chesette Building, Hurst Street, Birmingham B5 6SD. Tel: 021-622 4911. Fax: 021-622 7242.
- 306 Spearmark International Ltd**  
Howard Road, Eaton Socon, St Neots, Cambridgeshire PE19 3ET. Tel: 0480 213633. Fax: 0480 217048.
- 307 Spectrum Luminaires Ltd**  
2/2 Stanmore Industrial Estate, Bridgnorth, Shropshire WV15 5HP. Tel: 0746 761449. Fax: 0746 766445.
- 308 Speights Ltd**  
Classic Works, Mirfield, West Yorkshire WG14 8BJ. Tel: 0924 494176. Fax: 0924 480691.
- 309 Squire Lighting Ltd**  
Hartford House, Weston Street, Bolton, Lancashire BL3 2AX. Tel: 0204 380813. Fax: 0204 382355.
- 310 Starlite (Chandeliers) Ltd**  
127 Harris Way, Windmill Road, Sunbury-on-Thames, Middlesex TW16 7EL. Tel: 0932 788686. Fax: 0932 780283.
- 311 Stenda Quality Products Ltd**  
220 Katherine Street, Ashton-under-Lyme, Lancashire OL6 7AS. Tel: 061-343 1331.
- 312 Laura Stevens Lighting**  
Tunwell Mills, Victoria Road Industrial Estate, Eccleshill, Bradford, West Yorkshire BD2 2HE. Tel: 0274 640044.
- 313 The Straits Trading Co Ltd**  
Pendle View, Bournes Row, Houghton, Preston, Lancashire PR5 0DR. Tel: 0254 854363. Fax: 0254 853400.
- 314 Strathearn Lighting**  
49 Burrell Street, Crieff, Perthshire PH7 4DG. Tel: 0764 2509. Fax: 0764 3599.
- 315 Studen Products Ltd**  
Hedgehog House, Unit 8, Caldershaw Centre, Rooley Moor Road, Rochdale, Lancashire OL12 7NR. Tel: 0706 45225. Fax: 0706 50791.
- 316 Studio 17 (Lighting) Ltd (Inlite Group)**  
Hawtin Park, Pontllanfraith, Blackwood, Gwent NP2 2EU. Tel: 0443 862121. Fax: 0443 816763.
- 317 Sublime Lighting (Inlite Group)**  
Denaby Lane, Denaby Industrial Estate, Denaby, Doncaster, South Yorkshire DN12 4JJ. Tel: 0709 861553. Fax: 0709 860551.
- 318 Supashades Ltd**  
Nelson Way, Nelson Industrial Estate, Cramlington, Northumberland NE23 9BL. Tel: 0670 735218. Fax: 0670 735017.
- 319 Supertrim Ltd**  
Harrington Mills, Leopold Street, Long Eaton, Nottingham NG10 4QG. Tel: 0602 727265. Fax: 0602 722022.
- 320 Sussex Brassware Ltd**  
Napier Road, Castleham Industrial Estate, St Leonards-on-Sea, East Sussex TN38 9NY. Tel: 0424 440734. Fax: 0424 853862.
- 321 Bernard S Sutcliffe Ltd**  
105 Stainbeck Road, Leeds LS7 2PR. Tel: 0532 680409.
- 322 Swan Lighting**  
Unit 12, Queens Court, Greet Green Road, West Bromwich, West Midlands B70 9EG. Tel: 021-522 4733.
- 323 Bernard Szeps Lighting Ltd (Montrose International)**  
47/48 Berners Street, London W1P 3AB. Tel: 071-580 5316. Fax: 071-636 0243.
- 324 Take Ltd**  
75 Prince of Wales Road, London NW5 3LT. Tel: 071-267 3937/4124. Fax: 071-267 3997.
- 325 Tally Ho Lighting Co Ltd**  
Unit 31, Cam Centre, Wilbury Way, Hitchin, Hertfordshire SG4 0TW. Tel: 0462 438336. Fax: 0462 436669.
- 326 Tanner Lighting**  
Unit 4, Boscomoor Industrial Estate, Boscomoor Lane, Pankridge, Staffordshire ST19 5NU. Tel: 0785 715098. Fax: 0785 840204.
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Trinity Business Centre, 305/309 Rotherhithe Street, London SE16 1EY. Tel: 071-231 0955. Fax: 071-252 3820.
- 328 Helen Thomas Ltd**  
Battle House, School Lane, Naseby, Northamptonshire NN6 8BZ. Tel: 0604 740017. Fax: 0604 740700.
- 329 Andy Thornton Architectural Antiques**  
Ainleys Industrial Estate, Elland, West Yorkshire HX5 9JP. Tel: 0422 375595. Fax: 0422 377455.
- 330 Thousand and One Lamps Ltd**  
4 Barmeston Road, Catford, London SE6 3BN. Tel: 081-698 7238. Fax: 081-698 6134.
- 331 Thurber Manufacturing Ltd**  
109 Bordesley Street, Birmingham B5 5PL. Tel: 021-643 4677. Fax: 021-633 3557.
- 332 Tramar Ltd**  
South Lane, Bishop Wilton, York YO4 1SE. Tel: 0759 6741. Fax: 0759 6794.
- 333 Transomnia**  
Unit 3, Mahatma Gandhi Estate, Milkwood Road, London SE24 0JF. Tel: 071-737 0260. Fax: 071-733 0984.
- 334 Trident Manufacturing Ltd**  
95 Greengate, Salford, Manchester M3 7NG. Tel: 061-832 0212. Fax: 061-832 7171.
- 335 Tridonic Ltd**  
Thomas House, Hampshire International Business Park, Crockford Lane, Chineham, Basingstoke, Hampshire RG24 0NA. Tel: 0256 707000. Fax: 0256 707002.



## LIST OF MEMBERS

- |   |   |   |  |
|---|---|---|--|
| <p><b>336 Tungsram Lighting Ltd</b><br/>Nene House, Drayton Way,<br/>Drayton Fields Industrial Estate,<br/>Daventry, Northamptonshire<br/>NN11 5EA.<br/>Tel: 0327 77683.<br/>Fax: 0327 76386.</p> | <p><b>340 D M Walker (Lighting) Ltd</b><br/>Audby Lane, Wetherby, West<br/>Yorkshire LS22 4FD. Tel: 0937<br/>580158. Fax: 0937 584153.</p>  | <p><b>345 Josiah Wedgwood &amp; Sons Ltd</b><br/>Barlaston, Stoke-on-Trent ST12<br/>9ES. Tel: 0782 204141. Fax:<br/>0782 204402.</p>  | <p><b>350 Windsor Lighting Ltd</b><br/>Unit 18, 221/231 High Street,<br/>Slough, Berkshire SL11BY.<br/>Tel: 0753 691681.</p>                                     |
| <p><b>337 Vectase Plc</b><br/>Gorrels Way, Transpennine<br/>Trading Estate, Rochdale,<br/>Lancashire OL11 9XX. Tel:<br/>0706 341636. Fax: 0706<br/>861332.</p>                                    | <p><b>341 Walker Picton Manufacturing Ltd</b><br/>Unit 5, Totteridge Works,<br/>Tottridge Avenue, High<br/>Wycombe, Buckinghamshire<br/>HP13 6XG. Tel: 0494 439418.<br/>Fax: 0494 448692.</p> | <p><b>346 West One Ltd</b><br/>Hillside House, Avon Dassett,<br/>Leamington Spar, Warwickshire<br/>CV33 0AL. Tel: 0295 89402.<br/>Fax: 0295 89565.</p>                                | <p><b>351 George Wood (Woodworkers) Ltd</b><br/>Laundry Street, Pendleton,<br/>Salford, Manchester<br/>M6 6WJ.<br/>Tel: 061-736 6855.<br/>Fax: 061-745 9544.</p> |
| <p><b>338 Vitrea (Merchants) Ltd</b><br/>(trading as Glassexport)<br/>12 Clerkenwell Road, London<br/>EC1M 5PP. Tel: 071-253 1625.<br/>Fax: 071-608 0869.</p>                                     | <p><b>342 Warminster Lighting Centre Ltd</b><br/>Factory Lane, Warminster,<br/>Wiltshire BA12 8LT. Tel: 0985<br/>216624. Fax: 0985 215530.</p>  | <p><b>347 Wickshades Lighting Ltd</b><br/>Unit 5A, St Francis Way,<br/>Shefford Industrial Park,<br/>Shefford, Bedfordshire SG17<br/>5DZ. Tel: 0462 816321. Fax:<br/>0462 815548.</p> | <p><b>352 Christopher Wray's Contract Lighting</b><br/>600 Kings Road, London<br/>SW6 2DX.<br/>Tel: 071-736 8434.<br/>Fax: 071-731 3507.</p>                     |
| <p><b>339 Wade Ceramics Ltd</b><br/>Lighting Division, Manchester<br/>Pottery, Greenhead Street,<br/>Burslem, Stoke-on-Trent ST6<br/>4AE.<br/>Tel: 0782 575700.<br/>Fax: 0782 813663.</p>         | <p><b>343 Waterford Crystal (Lighting) Ltd</b><br/>Butlerstown, Waterford,<br/>Republic of Ireland. Tel: 010-<br/>353 517 3311.</p>   | <p><b>348 Wilkins &amp; Wilkinson (Elland) Ltd</b><br/>Valley Mills, Park Road, Elland,<br/>West Yorkshire HX5 9HP. Tel:<br/>0422 373783. Fax: 0422<br/>310027.</p>                   | <p><b>353 Yewtree Manufacturing Ltd (Bayoak Ltd)</b><br/>43 Yewtree Lane, Yardley,<br/>Birmingham<br/>B26 1AP.<br/>Tel: 021-706 8153.<br/>Fax: 021-706 1786.</p> |
|   | <p><b>344 Webb &amp; Kempf Ltd</b><br/>Denmans Dairy, Barrington,<br/>Ilminster, Somerset TA19 0JW.<br/>Tel: 0460 57080. Fax: 0460<br/>54335.</p>   | <p><b>349 Peter Williams Wood Creations</b><br/>Unit 3, Grigorhill Industrial<br/>Estate, Granny Barbour's Road,<br/>Nairn, Inverness-shire IV12<br/>5HY. Tel: 0667 62188.</p>        |  |

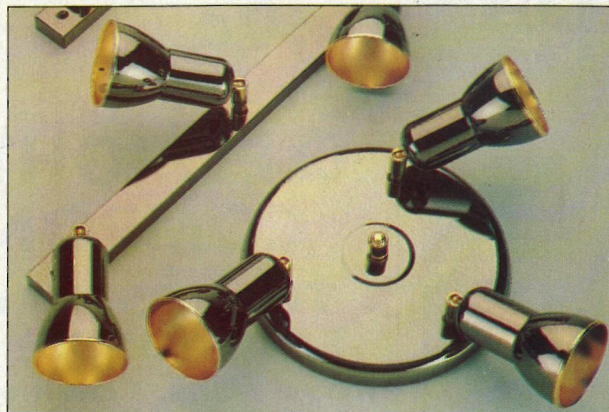
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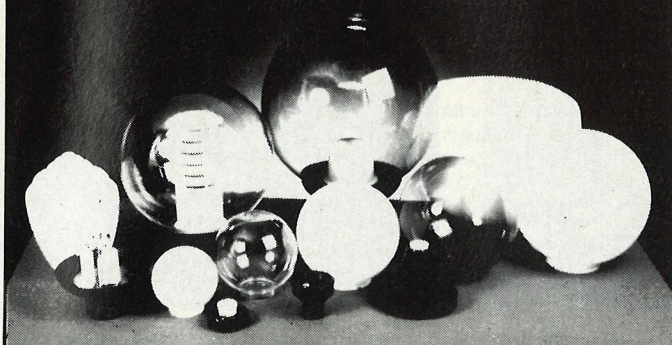




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- |   |  |   |  |
|---|--|---|--|
| <p><b>3 Abstracta Construction Ltd</b><br/>Fabric covered display plinths. Slimline display shelving.</p> <p><b>13 Ashley &amp; Rock Ltd</b><br/>Luminaire support coupler, lampholders, ceiling roses, batten lampholders — all wiring equipment.</p> <p><b>17 A Attenborough &amp; Co Ltd</b><br/>Braid and fringes for domestic lampshades.</p> <p><b>32 Belvedere</b><br/>Carved wood with decorative gilding or paintwork finish.</p> <p><b>40 The British Crystal Lighting Co Ltd</b><br/>Custom made fittings, cleaning and restoration.</p> <p><b>43 Buchanan Lighting Services</b><br/>Crystal, glass and brass components, halogen lamps and transformers.</p> <p><b>48 C &amp; M Packing Services</b><br/>Contract packing and assembly services.</p> <p><b>50 Candela Traditional Lighting Ltd</b><br/>Traditional lamp posts, lanterns, street lighting and illuminated bollards.</p> <p><b>54 Chandelier Cleaning &amp; Restoration Services Ltd</b><br/>Installation, maintenance and restoration of chandeliers.</p> <p><b>64 Chandelier Specialist Lamps Ltd</b><br/>Lamps for chandeliers and wall-lights.</p> <p><b>73 Collingwood VLM Ltd</b><br/>Luminaire accessories, glassware, brass and aluminium castings.</p> <p><b>82 Crompton Lighting</b><br/>Decorative lamps.</p> <p><b>84 Martin Dannell &amp; Co Ltd</b><br/>Laminated lampshade materials and trimmings, and ceramic lampbases.</p> <p><b>86 Daveen Manufacturing Co Ltd</b><br/>Beaded shades.</p> | <p><b>90 Decor Brass Ltd</b><br/>Polished brass electrical wiring accessories.</p> <p><b>97 Dencon Accessories Ltd</b><br/>Electrical accessories.</p> <p><b>99 Deta Electrical Co Ltd</b><br/>Festoon lighting, Christmas lights, brass and moulded lampholders, flex.</p> <p><b>106 Encon Industries Inc Ltd</b><br/>Track lighting.</p> <p><b>108 Eterna Lighting Ltd</b><br/>Striplights for the furniture industry.</p> <p><b>111 Fantasia Ceiling Fans Ltd</b><br/>Decorative ceiling fans with light accessories.</p> <p><b>124 G B Lighting Ltd</b><br/>Lampshade frames.</p> <p><b>125 GE Thorn Lamps Ltd</b><br/>Lamps.</p> <p><b>129 Golden Peacock Overseas Pvt Ltd</b><br/>Lamp holders and accessories. 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Glass and metal components.</p> <p><b>192 Lighting &amp; Electrical Components Ltd</b><br/>Lampholders, brass lighting components.</p> <p><b>198 S Lilley &amp; Son Ltd</b><br/>Lampholders, brass accessories, tube bends.</p> <p><b>207 MEM Limited</b><br/>Lamp-and battenholders, ceiling roses and outdoor festoon lighting.</p> <p><b>208 M &amp; F Products (Croydon) Ltd</b><br/>Wire lampshade frames.</p> <p><b>209 MK Electric</b><br/>Luminaire support couplers.</p> <p><b>211 Maestro Lite Ltd</b><br/>Detachable ceiling roses.</p> <p><b>216 Peter Martin Lighting Design Ltd</b><br/>Pleated lampshades.</p> <p><b>221 Metamec Clocks &amp; Lighting Ltd</b><br/>Outdoor decorative festoon lighting, garden and pool lighting and strip lights.</p> <p><b>229 Moss Lighting Ltd</b><br/>Lampshades and Tiffany frames.</p> <p><b>235 Noma Lites Ltd</b><br/>Christmas indoor and outdoor lights.</p> <p><b>239 Nuvotem Teo</b><br/>Low voltage lighting transformers</p> | <p><b>242 Osram Ltd</b><br/>Lamps.</p> <p><b>243 PLMC Ltd</b><br/>Shade carriers, gimbals, flicker bulbs and decor bulbs.</p> <p><b>251 Philips Lighting Ltd</b><br/>Lamps.</p> <p><b>255 Poole Pottery Ltd</b><br/>Lamp bases.</p> <p><b>258 Premier Decorations Ltd</b><br/>Christmas indoor and outdoor lights.</p> <p><b>271 Renker Ltd</b><br/>Lampshade materials.</p> <p><b>272 Ringslade Plastics Ltd.</b><br/>Diffusers and louvres.</p> <p><b>277 Rollo (UK) Ltd</b><br/>Electric candle lights</p> <p><b>282 P Ruddiman Ltd</b><br/>Silk and fabric shades.</p> <p><b>283 Russell Electrics Ltd</b><br/>Lighting accessories.</p> <p><b>299 Simon &amp; Simon (Lampshades) Ltd</b><br/>Wire lampshade frames and parts.</p> <p><b>315 Studen Products Ltd</b><br/>Bakelite and brass lampholders.</p> <p><b>319 Supertrim Ltd</b><br/>Trimmings.</p> <p><b>331 Thurber Manufacturing Ltd</b><br/>Metal and wood components.</p> <p><b>335 Tridonic Ltd</b><br/>Chokes, transformers, ignitors, electronic ballasts, electronic transformers, terminal blocks, reflectors.</p> <p><b>338 Vitrea (Merchants) Ltd (trading as Glassexport)</b><br/>Glass trimmings.</p> <p><b>340 D M Walker (Lighting) Ltd</b><br/>Lampholders, chains, rods and other accessories.</p> <p><b>348 Wilkins &amp; Wilkinson (Elland) Ltd</b><br/>Manufacture to customer's specification.</p> |
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# PRODUCT CLASSIFICATION

## OUTDOOR LIGHTS Traditional

### Alabaster

200, 290

### Aluminium

7, 21, 33, 41, 43, 44, 46, 50, 58, 65, 70, 75, 83, 85, 91, 105, 109, 113, 125, 126, 134, 136, 147, 153, 158, 164, 166, 175, 180, 194, 195, 218, 219, 222, 223, 230, 236, 272, 274, 283, 285, 290, 300, 307, 308, 314, 326, 329, 337, 342

### Brass

50, 58, 60, 68, 75, 91, 98, 106, 121, 135, 136, 153, 158, 189, 195, 200, 219, 230, 285, 290, 325, 329, 352

### Brass-plated

98, 126, 158

### Brass and glass

50, 68, 91, 98, 121, 136, 153, 158, 189, 194, 230, 254, 325, 352

### Ceramic and porcelain

158

### Chromium/stainless steel

50, 98, 126, 325

### Copper

46, 50, 68, 91, 98, 105, 121, 178, 195, 200, 219, 230, 307, 352

### Copper and glass

50, 68, 75, 91, 98, 121, 178, 219, 230, 352

### Glass, blown

33, 43, 46, 105, 153, 194, 222, 290, 304

### Glass, crystal

194, 290

### Glass, moulded

33, 41, 43, 153, 194, 222, 258, 290

### Gold-plated

98

### Iron

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### Laminates

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### Marble, stone

153

### Plaster

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### Plastic

33, 41, 83, 134, 151, 153, 221, 222, 230, 235, 258, 334

### Pottery

194

### Silver-plated

98, 327

### Steel

46, 83, 98, 108, 153, 194, 200, 222, 304

### Wood

327

## OUTDOOR LIGHTS Modern

### Aluminium

21, 41, 43, 58, 65, 82, 83, 85, 109, 113, 114, 116, 126, 134, 136, 158, 164, 178, 194, 218, 222, 236, 268, 272, 290, 300, 314, 326, 329, 348

### Brass

98, 113, 121, 136, 158, 178, 263, 325, 348

### Brass-plated

98, 113, 158, 178, 348

### Brass and glass

98, 113, 136, 158, 194, 325

### Ceramic and porcelain

158

### Chromium/stainless steel

98, 126, 178, 263, 325, 348

### Copper

98, 263, 348

### Copper and glass

98

### Glass, blown

33, 43, 194, 222, 290

### Glass, crystal

194, 290

### Glass, moulded

20, 33, 41, 43, 82, 194, 222, 258, 268, 290

### Gold-plated

98, 113

### Iron

51, 83, 98, 135, 194, 219

### Plaster

2

### Plastic

44, 82, 83, 91, 113, 114, 125, 134, 151, 203, 218, 222, 258, 272

### Pottery

194

### Silver-plated

98

### Steel

82, 83, 98, 194, 195, 200, 222, 348

### Wood

113

## CHANDELIERS AND MULTI-ARM FITTINGS Traditional

### Alabaster

65, 158, 194, 195, 249, 274, 283, 290, 293

### Aluminium

46, 98, 126, 153

### Brass

12, 14, 20, 23, 32, 33, 34, 37, 43, 44, 46, 50, 53, 56, 65, 68, 70, 72, 74, 85, 91, 92, 94, 98, 109, 112, 117, 121, 135, 136, 153, 158, 161, 163, 166, 169, 170, 175, 178, 180, 182, 189, 194, 195, 200, 214, 219, 222, 223, 226, 238, 241, 246, 249, 263, 274, 283, 285, 290, 293, 296, 300, 308, 310, 314, 321, 325, 326, 329, 331, 332, 334, 337, 338, 340, 342, 352, 353

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21, 33, 37, 44, 46, 56, 58, 70, 78, 85, 91, 98, 109, 112, 126, 158, 163, 178, 180, 182, 189, 194, 200, 218, 222, 223, 226, 238, 241, 246, 272, 274, 283, 285, 290, 321, 331, 334, 337, 342

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### Chromium/stainless steel

14, 65, 98, 126, 169, 170, 194, 226, 263, 325, 338

### Copper

98, 226

### Copper and glass

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### Fibre or glass optics

98, 226

### Glass, blown

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### Glass, moulded

12, 46, 65, 109, 117, 136, 153, 158, 170, 194, 214, 222, 226, 241, 274, 283, 285, 290, 337, 338

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23, 27, 34, 43, 46, 74, 91, 94, 98, 109, 112, 117, 135, 136, 158, 166, 169, 170, 176, 178, 189, 194, 200, 214, 218, 222, 223, 226, 241, 274, 283, 285, 290, 293, 308, 310, 326, 327, 332, 337, 338, 342

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27, 43, 91, 98, 105, 121, 166, 188, 194, 195, 226, 274, 304, 329, 344, 352

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### Marble, stone

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### Onyx

91, 158, 166, 246, 337

### Plaster

158, 327

### Plastic

21, 153

### Pottery

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### Silver-plated

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### Steel

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### Tiffany

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## CHANDELIERS AND MULTI-ARM FITTINGS Modern

### Alabaster

189, 194, 249, 293

### Aluminium

46, 98, 113, 126, 153, 185, 268, 290, 348

### Brass

14, 34, 37, 43, 44, 46, 72, 74, 85, 92, 94, 98, 109, 110, 113, 117, 121, 134, 135, 136, 153, 158, 169, 170, 178, 183, 189, 194, 195, 200, 214, 226, 241, 246, 249, 268, 290, 293, 300, 314, 325, 326, 331, 340, 348

### Brass-plated

21, 37, 46, 58, 60, 70, 85, 91, 98, 109, 110, 112, 113, 126, 158, 163, 178, 189, 194, 200, 222, 226, 241, 268, 290, 331, 334, 348

### Brass and glass

14, 21, 34, 37, 43, 46, 51, 58, 60, 72, 74, 85, 91, 92, 94, 98, 109, 112, 113, 117, 121, 136, 153, 158, 170, 178, 189, 194, 195, 202, 222, 226, 241, 254, 268, 290, 300, 325, 331, 334

### Ceramic and porcelain

21, 130, 158, 194, 300

### Chromium/stainless steel

14, 34, 82, 98, 126, 169, 170, 194, 226, 232, 268, 325, 348

### Copper

98, 110, 226, 348

### Copper and glass

98, 226

### Fibre or glass optics

98, 226

### Glass, blown

117, 153, 158, 170, 194, 195, 226, 232, 274, 285, 290

### Glass, crystal

40, 46, 51, 82, 91, 92, 117, 136, 158, 170, 194, 195, 214, 222, 232, 241, 285, 290, 293, 334

### Glass, moulded

46, 82, 109, 117, 136, 153, 158, 170, 178, 194, 195, 214, 222, 226, 241, 268, 274, 285, 290

### Gold, plated

34, 43, 46, 74, 82, 94, 98, 109, 113, 117, 135, 136, 158, 169, 170, 178, 189, 194, 200, 214, 226, 232, 241, 290, 293, 326, 342

### Iron

43, 98, 194, 226, 352

### Laminates

158

### Marble, stone

46, 153, 226

### Onyx

46

### Plastic

21, 113, 153, 158, 185, 285

### Pottery

189, 194, 334

### Shell

200

### Silver-plated

34, 46, 98, 170, 194, 214, 226, 241

### Steel

43, 82, 98, 153, 185, 194, 200, 226, 268, 334, 348

### Tiffany

25, 43, 178, 219

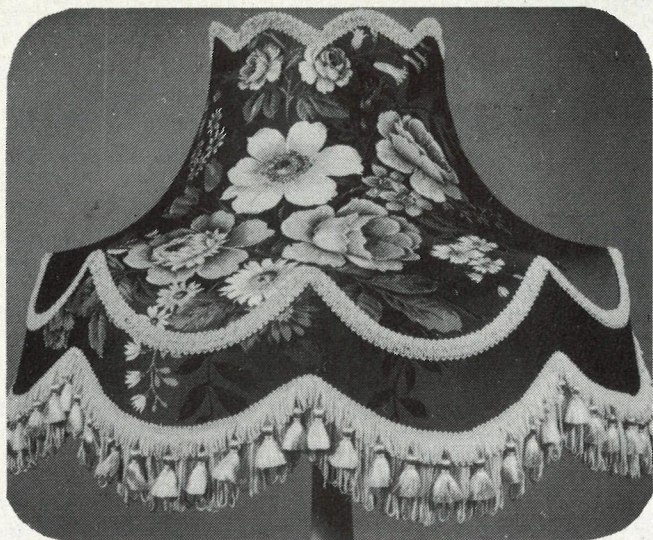
### Wood

21, 43, 46, 60, 92, 100, 113, 135, 136, 163, 178, 181, 187, 194, 200, 261, 266, 270, 326, 331, 334

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### Alabaster





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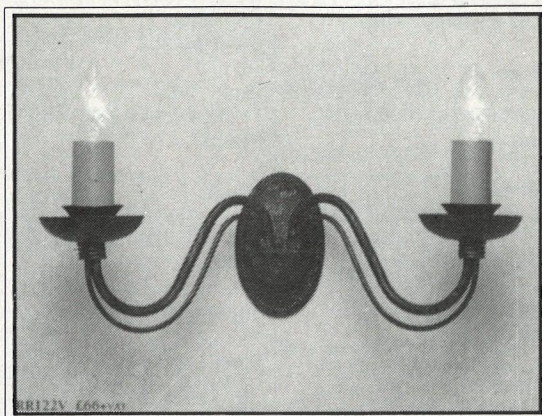
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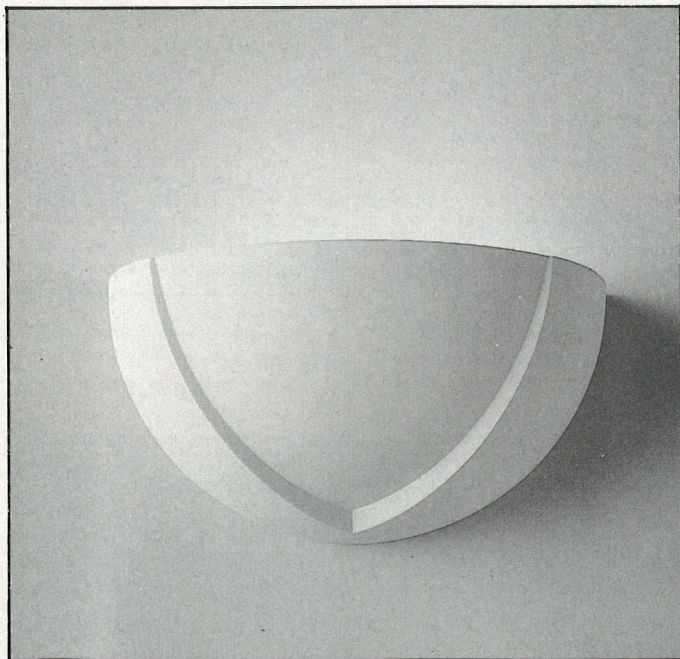
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# PRODUCT CLASSIFICATION

## PENDANT AND SINGLE LIGHT FITTINGS Traditional contd.

### Brass and Glass contd.

310, 325, 329, 331, 332, 334, 338, 342, 352

### Cane and basket

43, 46, 314, 337

### Ceramic and porcelain

12, 21, 33, 85, 91, 136, 158, 166, 187, 194, 195, 222, 223, 272, 283, 296

### Chromium/stainless steel

14, 43, 65, 98, 126, 169, 170, 187, 194, 226, 263, 283, 325, 338, 352

### Copper

75, 91, 98, 121, 226

### Copper and glass

91, 98, 121, 188, 195, 226, 283

### Fibre or glass optics

98, 226

### Glass, blown

40, 43, 65, 74, 78, 92, 109, 117, 134, 153, 158, 161, 170, 194, 195, 200, 223, 226, 232, 283, 285, 290, 337, 352

### Glass, crystal

40, 65, 92, 109, 112, 117, 136, 158, 170, 194, 195, 214, 218, 219, 222, 226, 241, 282, 285, 290, 293, 310, 334, 337, 340, 352

### Glass, moulded

43, 65, 72, 109, 117, 121, 134, 136, 153, 158, 170, 194, 200, 214, 222, 223, 226, 241, 283, 285, 290, 314, 337

### Gold-plated

27, 33, 34, 43, 91, 94, 98, 109, 112, 117, 135, 136, 158, 166, 169, 170, 180, 189, 194, 214, 218, 222, 223, 226, 241, 283, 290, 293, 300, 310, 327, 332, 342, 352

### Iron

27, 43, 91, 98, 105, 166, 194, 195, 226, 304, 329, 344, 352

### Laminates

120, 244, 327

### Marble, stone

153, 158, 226

### Paper, card, parchment

223, 229, 337

### Plaster

327

### Plastic

21, 93, 130, 146, 153, 158, 273, 337

### Pottery

194, 334

### Shell

434, 91, 243, 337

### Silver-plated

34, 98, 170, 194, 214, 226, 241, 327, 352

### Soft fabrics

46, 91, 130, 146, 167, 200, 337

### Steel

14, 43, 83, 98, 105, 153, 194, 218, 226, 304, 334, 337

### Tiffany

25, 37, 43, 91, 121, 130, 158, 167, 178, 195, 219, 243, 329, 352

### Wood

43, 65, 91, 92, 100, 135, 194, 195, 219, 222, 223, 228, 266, 276, 285, 290, 303, 304, 309, 327, 331, 334, 352

## PENDANT AND SINGLE LIGHT FITTINGS Modern

### Alabaster

118, 178, 189, 194, 195

### Aluminium

43, 46, 82, 83, 98, 113, 116, 134, 153, 158, 194, 195, 220, 268, 290, 302, 329, 348

### Brass

14, 21, 34, 37, 43, 54, 72, 74, 83, 85, 92, 94, 98, 110, 113, 117, 134, 135, 136, 153, 158, 169, 170, 194, 195, 200, 202, 214, 220, 226, 241, 246, 263, 268, 290, 293, 314, 325, 340, 348, 352

### Brass-plated

37, 58, 60, 78, 85, 98, 109, 110, 112, 113, 126, 156, 158, 189, 194, 218, 222, 226, 248, 268, 272, 285, 290, 331, 334, 348

### Brass and glass

14, 21, 34, 37, 43, 46, 51, 58, 60, 72, 74, 85, 92, 94, 98, 109, 112, 113, 136, 153, 158, 170, 189, 194, 195, 200, 218, 222, 226, 241, 248, 254, 268, 272, 285, 290, 325, 331, 334, 352

### Cane and basket

43, 46, 92, 135, 200, 243, 314

### Ceramic and porcelain

21, 51, 85, 136, 158, 194, 195, 200

### Chromium/stainless steel

14, 34, 43, 54, 82, 98, 126, 169, 170, 194, 195, 226, 263, 268, 325, 348

### Copper

98, 110, 226, 302, 348

### Copper and glass

98, 226

### Fibre or glass optics

85, 98, 226

### Glass, blown

12, 43, 74, 92, 109, 117, 134, 153, 158, 170, 194, 195, 200, 226, 232, 285, 290, 352

### Glass, crystal

40, 82, 92, 109, 117, 136, 158, 170, 194, 214, 222, 232, 241, 290, 293, 310, 334

### Glass, moulded

12, 43, 72, 82, 85, 109, 116, 117, 134, 136, 153, 158, 163, 170, 194, 195, 200, 214, 222, 226, 241, 268, 285, 290, 302

### Gold-plated

34, 43, 54, 82, 85, 94, 98, 109, 113, 117, 135, 136, 158, 169, 170, 194, 214, 226, 232, 241, 290, 293, 300, 310, 342

### Iron

43, 98, 194, 226, 352

### Laminates

54, 130, 168, 200, 244, 294

### Marble, stone

153, 226

### Paper, card, parchment

51, 168, 200, 229, 238, 243, 306

### Plaster

2, 195

### Plastic

13, 21, 54, 78, 93, 113, 130, 146, 153, 156, 158, 168, 200, 207, 215, 244, 273, 294

### Pottery

194, 334

### Shell

43, 91, 200, 243, 270

### Silver-plated

34, 98, 170, 194, 214, 226, 241

### Soft fabrics

46, 54, 91, 130, 146, 200, 238, 243

### Steel

43, 83, 98, 116, 153, 194, 195, 226, 268, 334, 348

### Tiffany

25, 37, 443, 130, 158, 178, 195, 200, 219, 340

### Wood

43, 45, 54, 60, 92, 100, 113, 194, 261, 266, 276, 331, 334

## FLUSH FITTINGS Traditonal

### Alabaster

43, 125, 195

### Aluminium

43, 50, 75, 98, 105, 134, 158, 194, 219, 230, 236

### Brass

12, 21, 23, 37, 43, 44, 46, 50, 65, 68, 72, 75, 98, 108, 117, 136, 158, 166, 170, 175, 178, 180, 187, 189, 194, 195, 200, 214, 219, 223, 226, 230, 241, 246, 274, 283, 285, 290, 293, 300, 310, 325, 329, 337, 352, 353

### Brass-plated

37, 43, 44, 46, 58, 65, 70, 85, 91, 98, 108, 109, 112, 158, 160, 166, 180, 189, 194, 195, 222, 223, 226, 238, 241, 246, 283, 285, 290, 331, 334, 337

### Brass and glass

2, 12, 21, 23, 43, 44, 46, 58, 65, 68, 70, 72, 85, 91, 92, 98, 108, 109, 112, 117, 121, 135, 136, 158, 166, 170, 178, 180, 189, 194, 195, 222, 223, 226, 230, 238, 241, 254, 274, 283, 285, 290, 300, 310, 325, 326, 329, 331, 334, 342, 353

### Ceramic and porcelain

12, 43, 194

### Chromium/stainless steel

43, 98, 170, 178, 187, 194, 226, 325, 352

### Copper

68, 75, 98, 226, 230

### Copper and glass

68, 98, 226, 230

### Fibre or glass optics

98, 226

### Glass, blown

33, 105, 117, 153, 158, 170, 194, 222, 223, 226, 232, 274, 283, 285, 290, 329, 352

### Glass, crystal

46, 108, 112, 117, 121, 136, 158, 170, 178, 194, 195, 200, 214, 222, 226, 274, 285, 290, 334, 337, 352

### Glass, moulded

12, 33, 46, 65, 72, 105, 108, 117, 121, 136, 147, 153, 158, 163, 170, 194, 214, 222, 223, 226, 254, 272, 274, 283, 285, 290, 314, 342

### Gold-plated

23, 27, 33, 43, 46, 98, 109, 112, 117, 136, 158, 170, 178, 189, 194, 214, 223, 226, 241, 283, 290, 342, 352

### Iron

43, 98, 194, 226, 304, 329, 352

### Laminates

130

### Marble, stone

153

### Plastic

21, 41, 108, 130, 153, 158, 230, 272

### Pottery

194, 272, 334

### Shell

43, 296

### Silver-plated

23, 98, 170, 194, 214, 226, 241, 352

### Soft fabrics

130

### Steel

43, 98, 194, 226, 304, 334

### Tiffany

43, 130, 219, 329, 352

### Wood

21, 43, 46, 91, 92, 100, 178, 187, 194, 195, 223, 228, 261, 285, 290, 331, 334, 337, 342, 352

## FLUSH FITTINGS Modern

### Alabaster

43, 125, 195, 293

### Aluminium

43, 55, 82, 98, 113, 158, 194, 236, 268, 348

### Brass

21, 37, 43, 44, 46, 55, 65, 72, 98, 110, 113, 117, 136, 158, 170, 178, 194, 195, 200, 214, 226, 241, 246, 268, 274, 293, 300, 325, 348, 352

### Brass-plated

37, 43, 58, 65, 82, 85, 91, 98, 109, 110, 112, 113, 158, 160, 194, 195, 222, 226, 241, 268, 290, 331, 334, 340, 348

### Brass and glass

21, 43, 46, 58, 65, 72, 85, 91, 92, 98, 109, 112, 113, 117, 121, 135, 136, 158, 163, 170, 178, 194, 195, 218, 222, 226, 241, 254, 268, 274, 290, 300, 325, 326, 331, 334, 342, 352

### Ceramic and porcelain

43, 194

### Chromium/stainless steel

43, 55, 82, 85, 91, 98, 121, 170, 178, 194, 195, 226, 232, 268, 325, 348

### Copper

98, 226, 348

### Copper and glass

98, 226

### Fibre or glass optics

98, 226

### Glass, blown

85, 117, 153, 158, 170, 194, 195, 222, 226, 232, 274, 290, 340, 352

### Glass, crystal

46, 82, 117, 125, 136, 158, 170, 178, 194, 200, 203, 214, 222, 232, 274, 290,



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# PRODUCT CLASSIFICATION

## FLUSH FITTINGS Modern contd.

### Steel

43, 54, 82, 98, 114, 194, 195, 226, 268, 334, 348

### Tiffany

43, 130, 178, 219, 340

### Wood

21, 43, 60, 85, 92, 100, 113, 194, 218, 222, 261, 266, 331, 334, 340, 342

## FLOOR LAMPS Traditional

### Alabaster

43, 135, 136

### Aluminium

50, 83, 98, 126, 285, 348

### Brass

12, 23, 33, 34, 37, 43, 44, 46, 50, 53, 56, 65, 66, 72, 74, 83, 91, 92, 94, 98, 109, 117, 121, 135, 136, 158, 160, 166, 169, 170, 175, 180, 187, 189, 194, 195, 196, 200, 202, 219, 223, 226, 241, 246, 263, 270, 274, 282, 285, 290, 296, 321, 325, 326, 329, 337, 340, 342, 348, 353, 353

### Brass-plated

33, 37, 56, 58, 91, 98, 109, 126, 158, 161, 180, 194, 223, 226, 238, 241, 246, 270, 282, 285, 342, 348

### Brass and glass

12, 21, 43, 56, 58, 72, 92, 94, 98, 109, 117, 136, 158, 170, 194, 195, 223, 226, 238, 241, 274, 282, 285, 325, 329

### Ceramic and porcelain

12, 102, 158, 194, 196, 201, 278, 282

### Chromium/stainless steel

14, 43, 40, 65, 126, 169, 170, 194, 226, 263, 274, 282, 325, 348

### Copper

98, 226, 348

### Copper and glass

98, 226

### Fibre of glass optics

98, 226

### Glass, blown

40, 170, 194, 226, 232, 352

### Glass, crystal

40, 170, 194, 226

### Glass, moulded

170, 194, 226

### Gold-plated

23, 33, 34, 43, 74, 91, 94, 98, 109, 135, 158, 169, 170, 180, 194, 223, 226, 241, 290, 327, 342

### Iron

43, 98, 105, 194, 195, 196, 226, 274, 304, 352

### Laminates

244, 327

### Marble stone

46, 136, 226, 241, 282

### Onyx

46, 51, 91, 92, 135, 136, 175, 200, 229, 241, 246, 263, 282, 296, 314, 321

### Paper, card, parchment

238, 243

### Plaster

327

### Plastic

21, 244

### Pottery

46, 194, 201, 278

### Silver-plated

23, 34, 74, 98, 170, 194, 226, 241, 327

### Soft fabrics

201

### Steel

43, 83, 98, 105, 194, 226, 282, 304, 337, 348

### Tiffany

25, 37, 43, 161, 352

### Wood

10, 43, 46, 65, 78, 91, 92, 100, 131, 135, 136, 160, 163, 166, 167, 175, 181, 187, 194, 195, 201, 219, 223, 228, 229, 238, 246, 261, 263, 274, 276, 282, 284, 285, 290, 296, 303, 309, 321, 322, 326, 331, 332, 337, 342, 349, 351, 352

## FLOOR LAMPS Modern

### Alabaster

43, 195

### Aluminium

55, 61, 82, 83, 98, 113, 116, 118, 126, 134, 178, 185, 220, 263, 268, 282, 290, 302, 348

### Brass

34, 37, 43, 46, 54, 55, 65, 72, 74, 83, 92, 94, 98, 109, 110, 113, 117, 118, 121, 134, 135, 158, 160, 169, 170, 178, 183, 194, 195, 200, 202, 219, 220, 226, 241, 246, 263, 268, 270, 274, 282, 300, 325, 326, 340, 348, 352, 353

### Brass-plated

37, 56, 58, 85, 98, 102, 109, 110, 113, 118, 126, 134, 158, 194, 218, 222, 241, 268, 282, 290, 342, 348

### Brass and glass

21, 34, 43, 56, 58, 72, 91, 92, 94, 98, 109, 117, 158, 170, 178, 194, 195, 200, 222, 226, 241, 268, 274, 282, 300, 325

### Ceramic and porcelain

92, 102, 158, 194, 201, 282

### Chromium/stainless steel

14, 34, 43, 54, 55, 61, 65, 85, 98, 118, 126, 169, 170, 178, 194, 195, 200, 218, 226, 232, 246, 263, 268, 274, 282, 325, 348

### Copper

98, 226, 348

### Copper and glass

98, 226

### Fibre or glass optics

98, 226

### Glass, blown

61, 118, 170, 194, 226, 232

### Glass, crystal

170, 194, 232

### Glass, moulded

61, 118, 160, 170, 194, 226, 268

### Gold-plated

34, 43, 54, 61, 74, 94, 98, 109, 113, 158, 169, 170, 194, 200, 226, 232, 241, 268, 290, 300, 342

### Iron

43, 51, 61, 98, 194, 226, 352

### Laminates

54, 186, 244

### Marble, stone

46, 61, 178, 226, 241, 282

### Onyx

46, 110, 241, 282

### Plaster

195

### Plastic

21, 54, 134, 253

### Pottery

46, 92, 116, 194, 201

### Silver-plated

34, 98, 170, 194, 226, 241

### Soft fabrics

54, 201

### Steel

43, 55, 83, 98, 116, 132, 163, 178, 185, 194, 195, 222, 226, 268, 282, 300, 302, 348

### Tiffany

25, 37, 43

### Wood

10, 43, 46, 54, 61, 78, 91, 92, 100, 113, 131, 132, 136, 178, 181, 194, 195, 201, 229, 238, 243, 270, 276, 282, 284, 285, 290, 309, 321, 326, 331, 332, 351

## WALL BRACKETS Traditional

### Alabaster

43, 65, 189, 194, 200, 249, 274, 283, 290, 293

### Aluminium

43, 46, 50, 75, 83, 98, 126, 153, 158, 194, 220, 223, 236, 285, 307, 348

### Brass

12, 14, 20, 21, 23, 33, 34, 37, 43, 44, 46, 50, 53, 56, 65, 68, 70, 72, 74, 75, 85, 91, 92, 94, 98, 109, 112, 117, 121, 135, 136, 153, 158, 161, 163, 166, 169, 170, 175, 178, 180, 182, 187, 189, 194, 195, 200, 214, 218, 219, 220, 222, 223, 226, 241, 246, 249, 263, 274, 283, 285, 290, 293, 296, 300, 308, 310, 314, 321, 325, 326, 329, 331, 332, 337, 338, 340, 342, 346, 348, 352, 353

### Brass-plated

21, 33, 37, 43, 44, 46, 56, 58, 70, 78, 85, 91, 98, 102, 109, 112, 126, 158, 163, 178, 180, 182, 189, 194, 218, 222, 223, 226, 238, 241, 246, 272, 283, 285, 290, 321, 331, 334, 337, 342, 348, 352

### Brass and glass

12, 14, 21, 33, 34, 43, 44, 45, 56, 58, 65, 68, 70, 72, 74, 85, 91, 92, 94, 98, 109, 112, 117, 121, 136, 153, 158, 161, 163, 166, 170, 178, 180, 182, 189, 194, 195, 200, 218, 222, 223, 226, 238, 241, 254, 274, 283, 285, 290, 296, 300, 310, 325, 329, 331, 332, 334, 338, 340, 342

### Ceramic and porcelain

12, 21, 23, 33, 43, 70, 85, 91, 102, 130, 158, 166, 178, 187, 194, 195, 223, 237, 238, 274, 278, 285, 290, 300, 340

### Chromium/stainless steel

14, 43, 50, 65, 98, 126, 169, 170, 187, 194, 226, 263, 274, 325, 338, 348, 352

### Copper

68, 75, 91, 98, 121, 226, 348

### Copper and glass

68, 91, 98, 226

### Fibre or glass optics

98, 226

### Glass, blown

40, 43, 65, 117, 153, 158, 170, 194, 222, 226, 232, 274, 283, 285, 290, 329, 338, 352

### Glass, crystal

40, 46, 51, 65, 91, 112, 117, 136, 158, 170, 194, 195, 214, 218, 219, 222, 226, 241, 254, 274, 285, 290, 293, 308, 310, 334, 338, 340, 352

### Glass, moulded

12, 43, 46, 65, 91, 117, 136, 153, 158, 170, 194, 203, 214, 222, 226, 241, 274, 283, 285, 290, 329, 338, 342

### Gold-plated

23, 27, 33, 34, 43, 46, 74, 91, 94, 98, 109, 112, 135, 136, 158, 166, 169, 170, 178, 180, 189, 194, 214, 222, 223, 226, 241, 283, 285, 290, 293, 300, 308, 310, 327, 332, 338, 342, 352

### Iron

43, 91, 98, 105, 163, 166, 188, 194, 195, 226, 230, 274, 304, 329, 344, 352

### Laminates

130, 158, 233, 244, 327

### Marble, stone

46, 102, 153, 158, 166, 178, 226

### Onyx

46, 166

### Paper, card, parchment

238

### Plaster

2, 91, 158, 162, 327, 337, 352

### Plastic

21, 130, 153

### Pottery

23, 43, 102, 189, 194, 237, 238, 278, 334

### Shell

43

### Silver-plated

23, 34, 65, 74, 98, 166, 170, 194, 214, 226, 241, 285, 327

### Soft fabrics

130

### Steel

43, 98, 105, 153, 194, 226, 230, 304, 334, 348

### Tiffany

25, 37, 43, 91, 121, 130, 178, 219, 329, 352

### Wood

10, 32, 43, 44, 46, 60, 65, 85, 92, 100, 131, 135, 163, 167, 178, 181, 187, 194, 195, 219, 222, 223, 228, 238, 261, 266, 274, 276, 285, 303, 308, 309, 321, 326, 331, 334, 337, 349, 352

## WALL BRACKETS Modern

### Alabaster

43, 132, 178, 189, 195, 200, 249, 293, 309

### Aluminium

43, 55, 82, 83, 98, 113, 116, 118, 126, 153, 158, 185, 194, 220, 236, 268, 290, 348

### Brass



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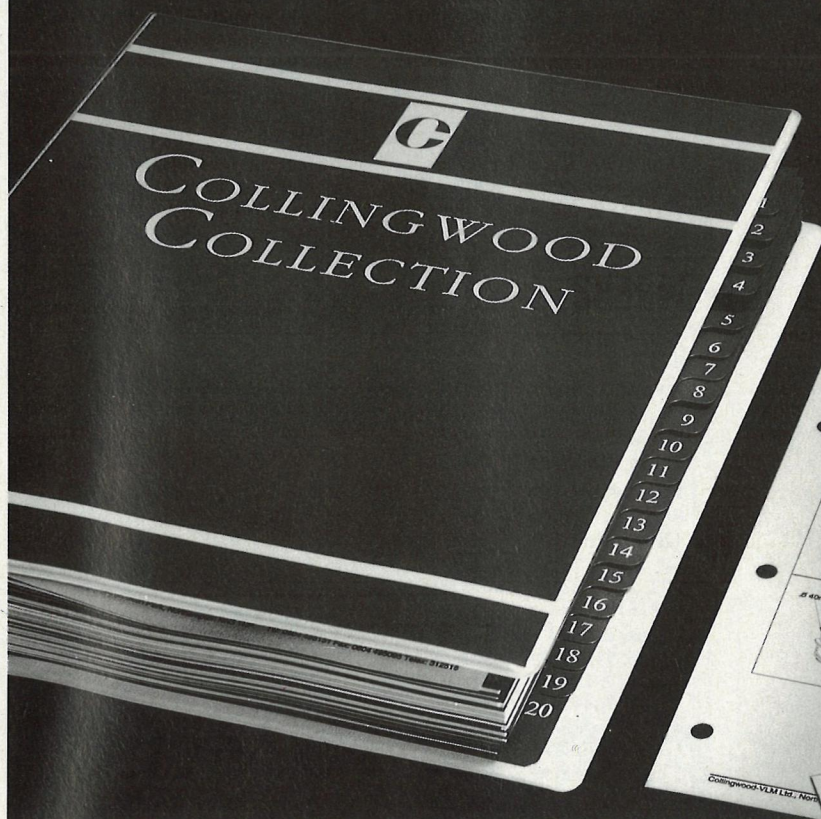
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Reader Service No. 326



# PRODUCT CLASSIFICATION

## WALL BRACKETS Modern contd.

### Chromium/stainless steel

14, 34, 43, 54, 55, 65, 82, 85, 98, 118, 126, 169, 170, 178, 194, 195, 226, 232, 246, 263, 268, 270, 274, 325, 348

### Copper

46, 98, 110, 226, 348

### Copper and glass

98, 132, 226

### Fibre or glass optics

85, 98, 226

### Glass, blown

43, 61, 65, 117, 118, 132, 153, 158, 170, 178, 194, 195, 222, 226, 232, 274, 290

### Glass, crystal

46, 51, 65, 82, 117, 136, 158, 170, 178, 194, 214, 232, 241, 274, 290, 293, 334

### Glass, moulded

43, 65, 82, 117, 118, 136, 153, 158, 170, 178, 194, 195, 203, 214, 222, 226, 241, 268, 274, 290, 342

### Gold-plated

34, 43, 46, 54, 74, 94, 98, 109, 113, 135, 136, 158, 169, 170, 178, 189, 194, 214, 226, 232, 241, 268, 290, 293, 300, 342

### Iron

43, 98, 194, 195, 226, 352

### Laminates

54, 130, 158, 233, 244

### Marble, stone

46, 153, 158, 178, 200, 226, 309

### Onyx

46

### Plaster

2, 132, 135, 158, 162, 178, 180, 195, 200, 342

### Plastic

21, 54, 113, 130, 153, 178, 185, 244

### Pottery

43, 189, 194, 237, 238, 334

### Shell

43, 340

### Silver-plated

34, 98, 170, 194, 214, 226, 241

### Soft fabrics

54, 130

### Steel

43, 55, 82, 98, 116, 153, 185, 194, 195, 226, 268, 334, 348

### Tiffany

25, 37, 43, 91, 130, 178, 219, 340

### Wood

10, 43, 46, 54, 60, 61, 92, 100, 113, 163, 178, 181, 194, 195, 261, 266, 270, 276, 285, 326, 331, 334

## SPOTLIGHTS

### Aluminium

41, 46, 55, 58, 82, 83, 85, 91, 98, 113, 147, 158, 194, 222, 268, 290, 302, 348

### Brass

34, 43, 46, 53, 55, 82, 92, 94, 98, 109, 113, 117, 121, 134, 135, 136, 158, 170, 175, 178, 180, 183, 194, 200, 203, 219, 226, 246, 263, 268, 290, 314, 325, 326, 342, 348, 352, 353

### Brass-plated

43, 58, 91, 98, 106, 113, 134, 158, 163, 178, 180, 189, 194, 200, 218, 222, 226, 238, 268, 272, 290, 331, 334, 337, 342, 348

### Brass and glass

43, 94, 98, 136, 158, 170, 189, 194, 226, 254, 268, 290, 325

### Ceramic and porcelain

91, 147, 194

### Chromium/stainless steel

34, 55, 82, 98, 170, 178, 194, 195, 203, 226, 246, 263, 268, 293, 325, 348

### Copper

98, 226, 348

### Copper and glass

98, 226

### Fibre or glass optics

98, 226

### Glass, blown

170, 194

### Glass, crystal

170, 194

### Glass, moulded

170, 194, 268

### Gold-plated

34, 46, 98, 113, 158, 170, 194, 226, 241, 246, 272

### Iron

98, 226

### Marble, stone

136

### Onyx

136

### Plastics

46, 113, 114, 125, 178, 195, 203, 238, 272

### Pottery

136, 194, 281

### Silver-plated

34, 98, 170, 194, 226

### Steel

33, 41, 55, 58, 98, 106, 163, 195, 222, 226, 268, 285, 302, 314, 334, 337, 340, 348

### Wood

43, 46, 85, 91, 92, 100, 113, 135, 175, 194, 195, 218, 238, 285, 290, 314, 331, 342

## TABLE LAMPS Traditional

### Alabaster

43, 44, 46, 65, 78, 91, 133, 135, 136, 160, 163, 189, 195, 200, 223, 246, 249, 265, 283, 285, 290, 293, 309, 314, 326, 337, 342

### Aluminium

43, 50, 83, 98, 126, 220, 282, 285, 348

### Brass

11, 12, 20, 21, 23, 33, 34, 37, 43, 44, 46, 50, 53, 56, 60, 52, 65, 66, 68, 70, 72, 74, 85, 90, 91, 92, 94, 98, 109, 112, 117, 121, 127, 133, 135, 136, 137, 153, 158, 159, 160, 161, 166, 169, 170, 175, 178, 180, 187, 189, 194, 196, 198, 200, 219, 220, 223, 226, 241, 243, 246, 248, 249, 263, 270, 274, 282, 283, 285, 290, 293, 296, 300, 308, 313, 314, 317, 321, 325, 326, 328, 329, 332, 338, 340, 342, 346, 348, 352, 353

### Brass-plated

33, 37, 43, 44, 46, 56, 58, 85, 91, 98, 109, 112, 126, 158, 160, 178, 180, 189, 194, 218, 223, 226, 238, 241, 243, 246, 270, 282, 283, 284, 285, 314, 334, 337, 342, 348

### Brass and glass

12, 33, 37, 43, 44, 56, 58, 66, 72, 74, 85, 91, 92, 94, 98, 109, 112, 121, 127, 136, 153, 161, 170, 178, 189, 194, 195, 200, 218, 22, 223, 226, 238, 241, 243, 248, 254, 274, 280, 282, 283, 285, 325, 328, 329, 332,

334, 338, 342

### Cane and basket

127, 159, 313, 333

### Ceramic and porcelain

11, 12, 15, 16, 20, 23, 32, 33, 43, 44, 58, 65, 66, 69, 80, 85, 91, 92, 96, 102, 103, 119, 124, 127, 130, 133, 135, 137, 140, 158, 160, 165, 166, 175, 178, 180, 186, 187, 188, 194, 196, 200, 201, 204, 217, 218, 219, 223, 227, 237, 238, 244, 246, 247, 255, 265, 270, 274, 275, 278, 281, 282, 283, 284, 285, 286, 290, 297, 301, 313, 317, 321, 328, 333, 337, 339, 340, 342, 352

### Chromium/stainless steel

43, 50, 65, 98, 126, 169, 170, 187, 194, 226, 263, 274, 282, 325, 338, 348, 352

### Copper

37, 62, 98, 127, 188, 226, 313, 348

### Copper and glass

98, 226

### Fibre or glass optics

98, 194, 226

### Glass, blown

40, 43, 158, 161, 170, 186, 194, 226, 244, 280, 283, 342, 352

### Glass, crystal

40, 65, 92, 112, 158, 160, 170, 178, 194, 195, 226, 243, 270, 280, 283, 293, 334, 337, 340, 342

### Glass, moulded

12, 43, 158, 170, 194, 226, 280, 283

### Gold-plated

20, 23, 33, 34, 43, 46, 74, 94, 98, 109, 112, 135, 158, 166, 169, 170, 194, 223, 226, 241, 282, 283, 285, 290, 327, 332, 337, 342

### Iron

43, 62, 98, 105, 127, 188, 194, 195, 196, 226, 274, 275, 304, 329, 352

### Laminates

161, 186, 201, 327

### Marble, stone

20, 46, 102, 136, 160, 178, 200, 201, 226, 241, 282, 309, 352

### Onyx

20, 46, 91, 92, 135, 136, 160, 166, 175, 241, 246, 263, 294, 296, 314, 321, 337, 342

### Paper, card, parchment

196, 333

### Plaster

137, 229, 327

### Plastic

21, 128, 201, 229

### Pottery

11, 16, 20, 21, 23, 27, 39, 43, 46, 59, 69, 74, 78, 86, 92, 93, 97, 102, 103, 119, 121, 133, 135, 136, 137, 140, 152, 159, 160, 163, 186, 194, 195, 200, 201, 217, 218, 223, 227, 229, 237, 238, 243, 247, 252, 257, 265, 270, 275, 278, 281, 284, 285, 286, 290, 295, 301, 313, 314, 321, 322, 334, 337, 342, 352

### Shell

243, 337

### Silver-plated

23, 34, 74, 98, 170, 194, 226, 241, 283, 298, 327, 352

### Steel

43, 98, 105, 116, 194, 226, 282, 285, 304, 334, 348

### Tiffany

25, 37, 43, 178, 257, 270, 282, 329, 352

### Wood

10, 32, 43, 44, 46, 62, 65, 74, 85, 91, 92, 100, 124, 131, 133, 135, 137, 140, 160, 166, 167, 181, 187, 188, 194, 195, 200, 201, 219, 223, 228,

238, 256, 261, 265, 266, 276, 282, 284, 301, 303, 308, 309, 317, 321, 326, 327, 331, 332, 333, 334, 342, 349, 351, 352

## TABLE LAMPS Modern

### Alabaster

43, 46, 51, 60, 78, 132, 195, 243, 249, 293, 309, 314, 326

### Aluminium

41, 43, 55, 61, 83, 98, 104, 113, 116, 118, 126, 147, 158, 185, 220, 268, 282, 302, 348

### Brass

11, 21, 34, 37, 43, 44, 46, 54, 55, 56, 65, 72, 74, 85, 90, 91, 92, 94, 98, 109, 110, 113, 117, 118, 121, 134, 136, 137, 158, 160, 169, 170, 178, 183, 194, 195, 200, 220, 226, 241, 246, 248, 249, 263, 268, 270, 274, 282, 293, 300, 314, 325, 326, 340, 346, 348, 352

### Brass-plated

37, 43, 46, 56, 68, 60, 85, 91, 98, 109, 110, 113, 118, 126, 134, 158, 178, 194, 226, 241, 268, 270, 282, 284, 314, 334, 342, 348

### Brass and glass

34, 37, 43, 56, 58, 60, 72, 74, 85, 91, 92, 94, 98, 109, 113, 118, 121, 136, 158, 160, 170, 178, 194, 200, 222, 226, 241, 248, 254, 268, 270, 274, 280, 282, 325, 334, 342

### Cane and basket

313

### Ceramic and porcelain

11, 23, 43, 52, 58, 65, 80, 85, 91, 92, 96, 102, 103, 134, 130, 132, 135, 137, 140, 158, 160, 163, 178, 186, 194, 200, 201, 204, 237, 238, 243, 247, 255, 264, 265, 270, 281, 282, 284, 285, 286, 290, 294, 306, 313, 342

### Chromium/stainless steel

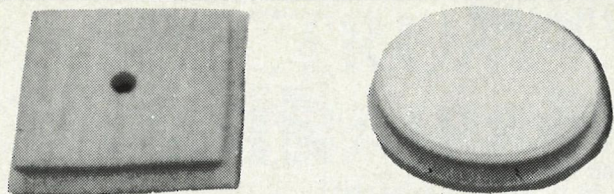
34, 43, 54, 55, 61, 65, 82, 98, 118, 126, 169, 170, 178, 194, 195, 226, 263, 268, 274, 282, 325, 348, 352

### Copper

37, 98, 226, 348

### Copper and glass



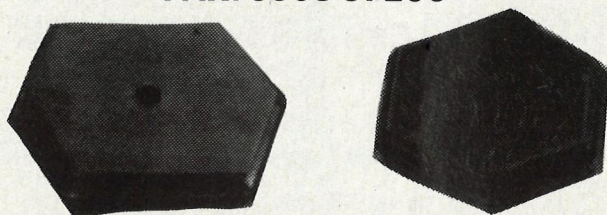


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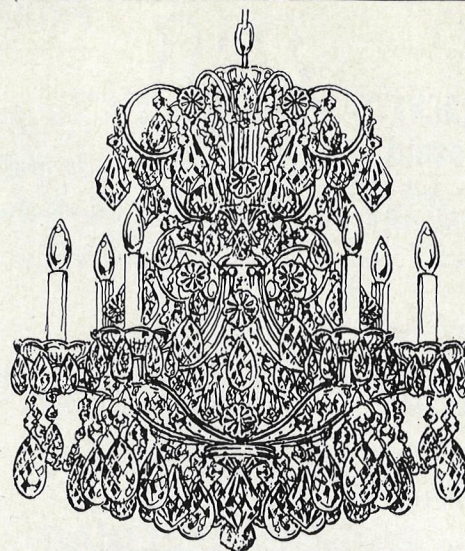
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# PRODUCT CLASSIFICATION

## TABLE LAMPS Modern contd.

### Plastic

21, 54, 113, 134, 185, 186, 201, 229, 244, 253

### Pottery

11, 21, 23, 39, 43, 46, 47, 51, 54, 59, 74, 78, 92, 102, 103, 116, 121, 124, 137, 140, 152, 163, 178, 186, 194, 195, 200, 201, 229, 237, 238, 243, 247, 256, 265, 270, 284, 285, 286, 290, 294, 295, 313, 314, 322, 332, 342

### Shell

243

### Silver-plated

34, 98, 170, 194, 226, 241, 270, 298

### Soft fabrics

54

### Steel

41, 43, 55, 98, 185, 194, 195, 226, 268, 282, 334, 348

### Tiffany

25, 37, 43, 147, 178, 270, 282, 340

### Wood

10, 43, 46, 51, 52, 54, 61, 65, 74, 91, 92, 100, 113, 124, 131, 132, 137, 140, 181, 194, 195, 200, 201, 243, 261, 265, 276, 282, 284, 309, 321, 326, 331, 334, 342, 351

## LAMPSHADES Traditional

### Alabaster

43

### Aluminium

282

### Brass

94, 219, 282, 325, 329, 346, 352

### Brass-plated

282, 299

### Brass and glass

94, 282, 325, 352

### Cane and basket

43, 46, 88, 91, 135, 140, 147, 158, 202, 229, 265, 342

### Ceramic and porcelain

35, 58, 69, 160, 217, 247, 278, 282, 339

### Chromium/stainless steel

263, 325

### Copper

282

### Cork

201

### Glass, blown

21, 40, 43, 74, 91, 95, 135, 161, 194, 195, 202, 223, 283, 285, 290, 322, 329, 340, 352

### Glass, crystal

40, 46, 91, 135, 282, 285, 290

### Glass, moulded

43, 46, 91, 95, 140, 194, 195, 223, 282, 283, 285, 290, 296, 328, 329, 334, 342

### Laminates

11, 35, 46, 65, 78, 88, 90, 96, 121, 124, 128, 130, 137, 140, 158, 166, 175, 188, 195, 201, 216, 238, 244, 265, 282, 284, 290, 317, 321, 322, 337

### Onyx

160

### Paper, card, parchment

10, 11, 23, 46, 62, 65, 85, 88, 91, 124, 128, 135, 140, 158, 175, 178, 179, 186, 188, 195, 201, 202, 216, 219, 223, 237, 238, 270, 274, 275, 282, 284, 290, 308, 314, 327, 328,

342, 346, 352

### Plastic

21, 46, 78, 130, 140, 146, 158, 201, 202, 237, 273

### Pottery

46, 69, 247, 278, 295

### Shell

21, 46, 91, 135, 140, 147, 202, 243, 342

### Silver-plated

159

### Soft fabrics

10, 11, 15, 18, 21, 23, 28, 33, 35, 44, 46, 49, 58, 60, 65, 66, 72, 74, 78, 80, 86, 91, 92, 93, 94, 96, 102, 115, 121, 124, 128, 130, 133, 135, 136, 137, 140, 146, 147, 152, 158, 160, 165, 166, 167, 175, 178, 188, 195, 200, 201, 204, 218, 223, 229, 232, 238, 257, 265, 270, 275, 280, 284, 286, 289, 294, 297, 299, 308, 313, 314, 317, 321, 322, 327, 328, 328, 342, 347

### Steel

299

### Tiffany

25, 43, 46, 91, 102, 130, 135, 140, 158, 160, 161, 167, 178, 195, 201, 202, 229, 299, 329, 342, 352

### Wood

228

## LAMPSHADES Modern

### Alabaster

51

### Aluminium

282

### Brass

94, 263, 282, 325, 346, 352

### Brass-plated

282, 299

### Brass and glass

94, 282, 325, 352

### Cane and basket

18, 19, 43, 46, 88, 91, 135, 140, 147, 158, 202, 229, 243, 265, 290, 340, 342

### Ceramic and porcelain

35, 58, 160, 247

### Chromium/stainless steel

263, 325

### Cork

201

### Glass, blown

21, 40, 43, 74, 95, 135, 160, 194, 195, 202, 285, 290, 340, 342, 352

### Glass, crystal

40, 46, 285, 290

### Glass, moulded

43, 46, 91, 95, 194, 195, 285, 290, 334, 342

### Laminates

11, 18, 19, 35, 44, 46, 49, 54, 65, 78, 80, 88, 90, 96, 121, 124, 128, 130, 137, 140, 158, 168, 179, 186, 195, 200, 201, 216, 232, 238, 244, 256, 265, 284, 290, 299, 317, 321, 322

### Onyx

160

### Paper, card, parchment

10, 11, 23, 46, 58, 61, 62, 65, 74, 85, 85, 88, 102, 124, 128, 140, 147, 158, 163, 168, 178, 179, 186, 188, 195, 201, 202, 216, 219, 237, 238, 243, 270, 274, 275, 282, 284, 290, 299, 306, 314, 342, 346

### Plaster

160

### Plastic

21, 46, 54, 78, 85, 130, 140, 146,

158, 163, 168, 201, 202, 237, 273, 282, 342

### Pottery

46, 247, 295

### Shell

21, 46, 58, 60, 91, 140, 202, 243, 340, 342

### Silver-plated

346

### Soft fabrics

10, 11, 15, 18, 19, 21, 23, 28, 33, 35, 46, 47, 52, 54, 58, 65, 72, 74, 78, 80, 92, 94, 96, 102, 121, 124, 128, 130, 132, 136, 137, 140, 146, 147, 152, 158, 160, 163, 167, 178, 195, 200, 201, 229, 238, 243, 256, 265, 270, 280, 282, 284, 293, 294, 297, 299, 313, 314, 317, 322, 342, 347

### Steel

282, 299

### Tiffany

25, 43, 46, 78, 91, 130, 140, 156, 158, 160, 163, 178, 195, 201, 202, 229, 282, 299, 340, 342

### Wood

35, 54

## NOVELTY AND EFFECTS LIGHTING

### Aluminium

81, 158

### Brass

158, 263

### Brass-plated

158

### Brass and glass

158, 282

### Ceramic and porcelain

103, 119, 201, 264

### Chromium/stainless steel

81

### Fibre or glass optics

44, 175, 342

### Glass, moulded

81, 258

### Paper, card, parchment

243, 306

### Plaster

337

### Plastic

104, 107, 235, 253, 358, 334, 337

### Pottery

103, 119, 147, 282, 295, 321, 342

### Soft fabrics

305, 337

### Wood

228, 263

## LIGHTING CONTROLS

### Brass

135, 141, 178, 180, 352

### Brass-plated

180

### Chromium/stainless steel

141, 178

### Copper

178

### Laminates

54

### Plastic

54, 135, 141, 178, 334

### Soft fabrics

54

### Steel

337

## DECORATIVE FLUORESCENT FITTINGS

### Alabaster

65

### Aluminium

41, 43, 55, 82, 98, 116, 153, 185, 268, 272

### Brass

43, 50, 55, 65, 98, 153, 158, 170, 180, 195, 219, 226, 352

### Brass-plated

65, 98, 158, 180, 226

### Brass and glass

43, 65, 98, 153, 170, 226, 268

### Chromium/stainless steel

50, 55, 65, 98, 170, 195, 226

### Copper

98, 226

### Copper and glass

98, 226

### Fibre or glass optics

65, 153, 170, 178, 226

### Glass, blown

65, 153, 170, 178, 226

### Glass, crystal

170, 226

### Glass, moulded

65, 82, 153, 170, 178, 194, 226, 268

### Gold-plated

98, 158, 170, 226, 268, 327

### Iron

98, 226

### Laminates

327

### Marble, stone

153

### Plaster

178, 327

### Plastic

41, 153, 178, 185, 195, 209, 246, 272

### Silver-plated

98, 170, 226, 327

### Steel

55, 82, 98, 104, 125, 153, 185, 195, 226, 290

### Wood

65, 327

## SECURITY LIGHTING

### Aluminium

41, 44, 55, 91, 98, 113, 114, 125, 158, 178, 180, 194, 218, 222, 236, 272, 307, 337, 342

### Brass

43, 55, 98, 106, 113, 158, 226, 325, 352



## PRODUCT CLASSIFICATION

### SECURITY LIGHTING Contd.

**Iron**  
51, 98, 158, 226, 290  
**Marble, stone**  
226  
**Plaster**  
178  
**Plastic**  
44, 114, 125, 151, 158, 178, 218, 222, 337  
**Silver-plated**  
98, 226  
**Steel**  
55, 98, 106, 158, 178, 222, 226, 337  
**Wood**  
113

### LOW VOLTAGE LIGHTING

**Aluminium**  
43, 55, 82, 91, 98, 113, 116, 118, 135, 158, 178, 194, 203, 220, 222, 268, 285, 302  
**Brass**  
7, 34, 43, 46, 51, 55, 91, 94, 113, 118, 135, 141, 158, 170, 178, 180,

194, 195, 200, 203, 214, 219, 220, 226, 242, 246, 263, 268, 274, 285, 296, 325, 352

#### Brass-plated

43, 65, 91, 98, 113, 118, 135, 141, 158, 178, 180, 194, 195, 203, 218, 222, 226, 241, 244, 268, 272, 274, 314, 352

#### Brass and glass

43, 94, 98, 118, 158, 170, 194, 195, 203, 226, 241, 244, 268, 325

#### Ceramic and porcelain

119, 270

#### Chromium/stainless steel

34, 35, 43, 46, 55, 65, 82, 98, 118, 141, 170, 178, 194, 195, 226, 244, 246, 263, 268, 274, 285, 325

#### Copper

98, 226

#### Copper and glass

98, 226

#### Fibre or glass optics

98

#### Glass, blown

43, 118, 170, 195, 226, 244

#### Glass, crystal

117, 118, 170, 214, 226

#### Glass, moulded

43, 116, 118, 170, 195, 214, 226, 268

#### Gold-plated

35, 43, 98, 113, 117, 158, 170, 194, 203, 214, 226, 241, 246, 268, 285, 290

#### Iron

98, 226

#### Plaster

2, 195

#### Plastic

91, 104, 114, 221, 235

#### Pottery

119

#### Silver-plated

98, 170, 214, 226, 241

#### Steel

33, 46, 55, 65, 98, 106, 108, 116, 125, 147, 178, 195, 222, 226, 268, 290

#### Wood

113

### CHILD-APPEAL LIGHTING Traditional

#### Ceramic and porcelain

103, 119, 135, 282

#### Chromium/stainless steel

282

#### Paper, card, parchment

140

#### Plastic

146

#### Pottery

92, 103, 119, 135, 147, 252, 295, 342

#### Soft fabrics

117, 135, 140, 143, 146, 222, 305

### CHILD APPEAL LIGHTING Modern

#### Ceramic and porcelain

103, 282, 306

#### Chromium/stainless steel

282

#### Paper, card, parchment

140, 306

#### Plastic

107, 146

#### Pottery

92, 103, 147, 295, 342

#### Soft fabrics

18, 117, 140, 143, 146, 238 305



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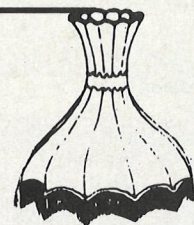
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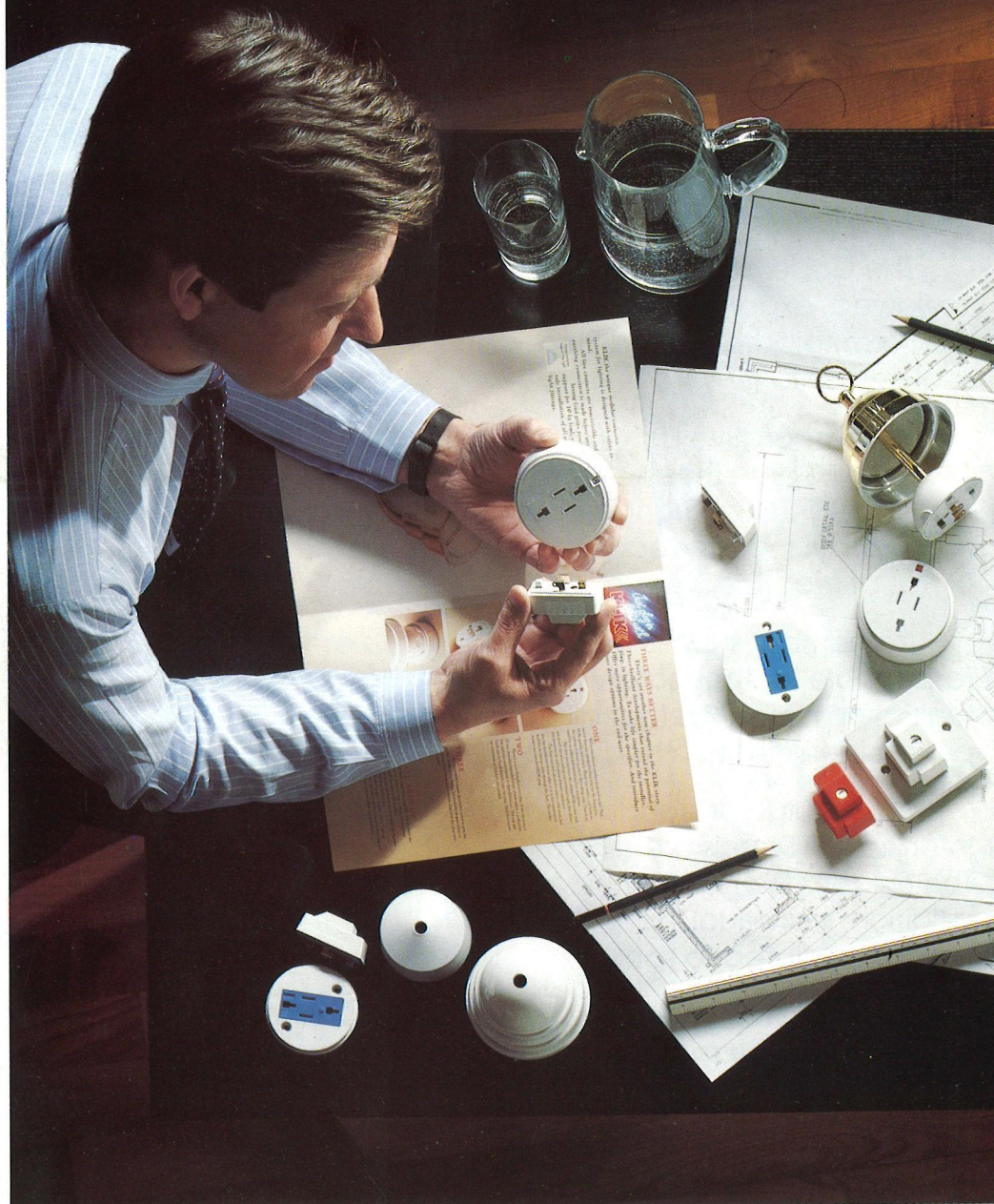
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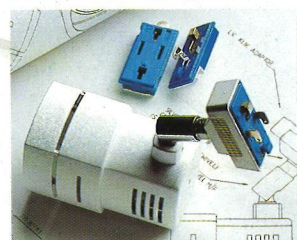
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