

## INVESTIGATING THE LATEST TRENDS AND PRODUCTS IN LIGHTING

Technological change and new approaches to the design of lighting schemes have changed the whole landscape of lighting design.

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## A word from the editor...



One of the problems in the lighting world is what exactly is meant by the expression 'lighting design'. Those in the know understand it to mean the process of designing with light. But many, perhaps the majority, see it as meaning the 'design of lights'. Whilst this confusion will probably remain with us for the foreseeable future, there is not much doubt that those who design with light gain considerably greater recognition than those who design the tools with which they work. This edition of FUSE attempts to redress this imbalance by looking at the work of David Morgan, a UK-based designer who focusses on the design of light fittings or, more precisely, luminaires. He deals only in the field of technical lighting 'instruments' and not in the other, very large, field of decorative light fitting design – an area which will be the subject of a future edition.

The design and engineering of a lighting product is a complex process. Often driven by the demands of a particular application or a gap in a product range, the design process has to consider the creation of a suitable environment within which to operate the chosen light source, thermal dictates, the optical performance of the fitting, overall efficiency, electrical safety, code compliances, physical dimensions and the visual image of the final product. These criteria are rarely mutually compatible and it takes much experience to achieve a fully functional design, the form of which can also appear appropriate when used in visible applications.

*André Tammes is Indesign's  
Lighting Editor.*

WORDS DAVID MORGAN

## Technological innovation has seen a radical re-thinking of the lighting design process itself. David Morgan discusses the implications.

The design of technical lighting equipment has been changing rapidly over the past decade as solid state lighting (LEDs) takes over from traditional light sources in many lighting applications.

Strangely enough, the luminaire design process has not changed quite as dramatically as the actual lighting products themselves.

My London-based design company has been working with the lighting industry for over 30 years to create innovative lighting products. So, we have lived through a number of these technology changes, starting with the MR 16 halogen lamp and now facing the challenge of designing for flexible OLED sheet.

However, the current state of flux in the lighting industry is unprecedented. The transition from the gas mantle to electric lighting took several decades and the incandescent lamp has been an important source for over 100 years.

Mirroring the technological changes in the lighting market there has been an equal change in the way that lighting schemes are designed. When I started designing there were only two independent lighting designers operating in the UK – most schemes were designed by the manufacturers. Now there are hundreds of lighting design companies and consultants working on major domestic and international projects, many of them within a few miles of our offices, several of whom have become clients.

My company spent many years working as design consultants to lighting manufacturers around the world including Louis Poulsen, Holophane, Thorn Lighting and Panasonic and this work continues to grow up to today.

However, an increasing amount of our activity is now based on project work with lighting designers.

We have our own manufacturing company to produce the resulting products and are much more involved with the complete process of luminaire designs for particular projects.

The products and systems that are developed for specific projects have now become the basis for a successful prêt-à-porter range that lighting designers are specifying on projects every day.

A good example of this change is the 3D LED Flex 100 system that we created specifically for the auditorium of the Zaha Hadid-designed Heydar Aliyev Center in Bakuk, Azerbaijan. We were introduced to the project by MBLD lighting designers who we had worked with on previous projects. The interior of the auditorium required a three-dimensionally flexible, high power LED system to provide all of the ambient light in the space. The lighting system was to be housed in five deep coves that ran around the interior of the auditorium with all the light being indirectly reflected from the wooden panelled surface. We had already developed a number of flexible LED lighting systems, but nothing with the power or degree of flexibility required for this project. Working to a tight deadline, we developed a concept of a highly efficient, finned die cast heat sink which would be linked together in a flexible chain to follow the complex building contours. These chains were fitted on to adjustable angle brackets so that the light output could be aimed to follow the surfaces shapes. The coves were deep, so we designed a spring clip mounting system to ease installation and servicing. Using very warm white LEDs produced by the leading Japanese

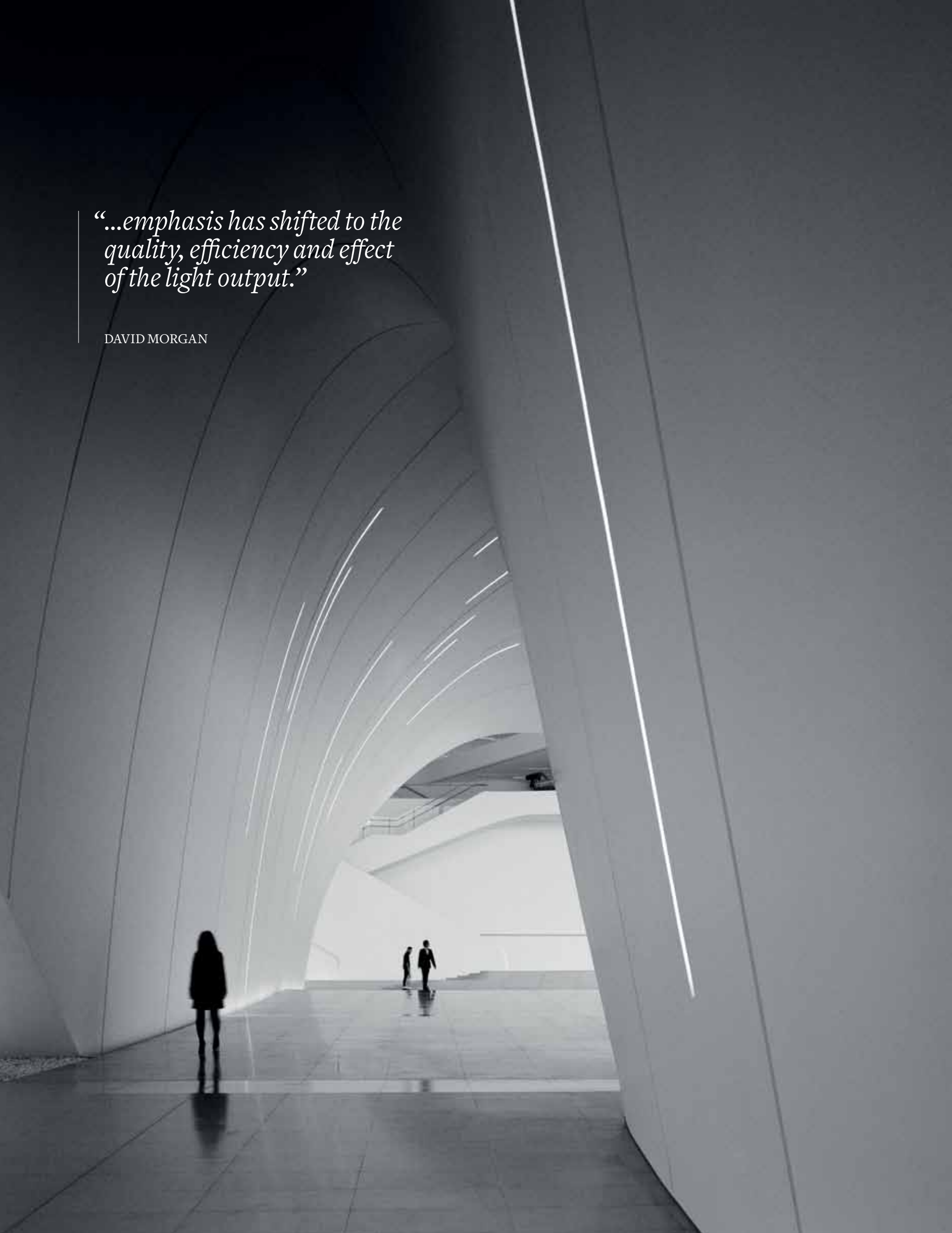
**PREVIOUS** Detail of lighting integrated into interior curves of the auditorium (Photo: Hufton and Crow)

**OPPOSITE** The lighting design creates a warm and varied illumination in the space (Photo: Hufton and Crow)

**RIGHT** 3D LED Flex 100 Modular, flexible LED linear lighting system by Radiant Lighting

**BELOW** The lighting follows the sinuous lines of the auditorium's interior ribs (Photo: Helen Binet)

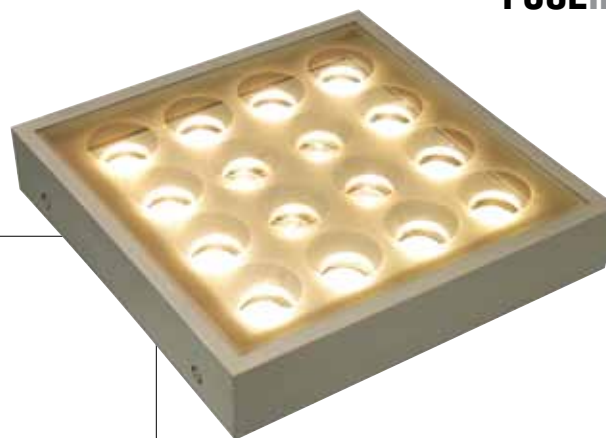




*“...emphasis has shifted to the quality, efficiency and effect of the light output.”*

DAVID MORGAN





company Nichia (who developed the first white LEDs), we built prototype test samples for discussion and evaluation with the ZHA and MBLD designers.

The key design issue with all LED luminaire design is the control of the heat dissipation from the LED emitters. If this is not handled correctly the LEDs will fail prematurely and operate well below their potential efficiency. Fortunately we got the size and detail design of this heat sink within the necessary performance level and were able to progress the design through to production within a demanding deadline. Uniformity of colour temperature is another critical issue for LED luminaire design and in the early days it was very difficult to achieve a wall washing effect without seeing a variety of colour temperatures. By working closely with Nichia we were able to control the precise batch of LEDs to be used on the project so the appearance of the light was remarkably consistent. In total, over 260 metres of the system were used on this project to create a warm and inviting glare-free space. The project has won a number of lighting design awards.

Following the successful development of the 3D LED Flex 100 system for this project it has now become one of our best-selling standard ranges and we have completed projects including Burberry stores and a private hospital in London, a parliamentary chamber in Turkey, a library in Canada. We have also developed smaller versions based on the same design concept for use in commercial and hospitality applications.

The 3D LED Flex 40 is our most popular size and is available in versions for interior and exterior applications.

The interior RGBW version was used in the refurbishment of the Hammer-smith Apollo where we worked closely with lighting designer Jim Morse to develop a custom light engine including a very warm white LED combined with red, blue and green LEDs. Although the cove in this project only curves in one plane, the individual modules of the system also needed to be set at various angles to project the light onto the ceiling surface. The three-dimensionally flexible joints between modules allow the system to bend in the horizontal plane and also to be angled in the vertical plane.

In my early days as a luminaire designer I was primarily concerned with the external appearance and construction of the lighting product. As our business has developed so that we are now working much more closely with architects and lighting designers to light their projects, the emphasis has shifted to the quality, efficiency and effect of the light output. Combining careful attention to detail in the luminaire design with a keen awareness of the architect's lighting vision makes for a demanding but extremely satisfying product portfolio.

David Morgan runs David Morgan Associates, a London-based international design consultancy specialising in luminaire design and development and is also MD of Radiant Architectural Lighting.

*dmadesign.co.uk*  
*Radiant Lighting is available*  
*in Australia from*  
*JSB Lighting jsblighting.com.au*

**OPPOSITE** Corridors outside the auditorium echo its fluid forms (Photo: Helen Binet)  
**ABOVE** Regent's Place Pavillion by Carmody Groarke Architects, with RAD 250 IP68 LED buried upright luminaires designed by David Morgan Associates, pictured top right (Photo: Luke Hayes)  
**RIGHT** Louis Poulsen SPR12 projector luminaire, designed by David Morgan Associates

