

# 3lux:letters

LIGHT | ARCHITECTURE | TECHNOLOGY 2 | 2015



**lux:** Light and sales space  
Artful orchestration

**lux:** Light and presentation  
Learning from museums

**lux:** Light and change  
Simple management



### Dear Readers,



Light in sales rooms essentially has two tasks: Firstly, it must provide clients with swift and simple orientation. Secondly, it must place the goods in an appropriate light and make shopping pleasant. Well-planned illumination can boost successful sales by emphasising products' qualities, supporting a brand image, or kindling positive emotions. Here, skilfully set highlighting can carefully direct the clients' gaze and dynamic light orchestration can bring more life to sales premises.

In our main article on "Learning from Museums", Carla Wilkins takes a broader look at things and show what museum insights can be adopted for lighting in shops (p. 10). In our interview (p. 18) Mona Khmais (JK Lighting Design, Büttelborn, Ger.), Guido Trampitsch (Söhne & Partner Architekten, Vienna, Aus.) and Katja Winkelmann (Licht 01 Lighting Design, Hamburg, Ger.) describe how light planners and architects handle artificial light and daylight, and the influence corporate design has on plans.

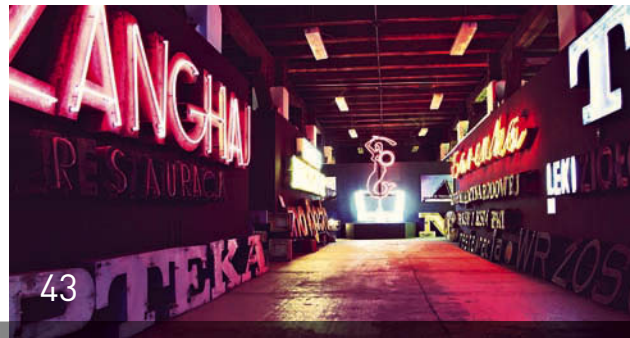
Realised projects show how different groups of commodities, from fashion through food to sportswear should be illuminated and presented correctly: Breuninger Department Store in Düsseldorf (p. 22), the Jelmoli Food Market in Zurich, Switzerland (p. 28) and the Intersport Leffers sports and outdoor store in Wilhelmshaven (p. 32).

In the LED age there are still no all-round luminaires. In our question for planners (p. 38) we identify the criteria that are particularly important for light planning in the fields of production, logistics, wholesaling and sales. Moreover, we focus closely on the options for dynamic light controls, and present our new light management system LiveLink (p. 40).

I hope you will enjoy reading the current issue of 3lux:letters!

Yours sincerely,

Thomas Kretzer, CEO TRILUX Vertrieb GmbH



# LIGHT AND RETAIL

04	<b>lux:</b> VIEWS	New luminaires and current installations, architecture and events relating to light, from all over the world
	<b>lux:</b> HISTORY	The trend towards miniaturisation
07	<b>lux:</b> STATEMENT	Staging (with) light – Stephan Renkes
09	<b>lux:</b> READING	Three books recommended by the Editorial board
10	<b>lux:</b> SPOT	Learning from museums – Carla Wilkins
14	<b>lux:</b> IMPRESSION	Wholesale or The parts and the greater whole
18	<b>lux:</b> REFLECTION	Mona Khmais (JK Lighting Design), Guido Trampitsch (Söhne & Partner Architekten), Katja Winkelmann (Licht 01 Lighting Design)
22	<b>lux:</b> ARCHITECTURE	Breuninger Department Store in Düsseldorf/DE, Food Market in the Jelmoli Store in Zurich/CH, Leffers Sports Shop in Wilhelmshaven/DE
38	<b>lux:</b> SERVICE	From production to end consumer: LEDs – universal solution spanning different areas of application?
40	TRILUX	LiveLink: Smart Light Management System
42	<b>lux:</b> ART	Light is a vector – Arnout Meijer, Neon Muzeum in Warsaw/PL, Percent for Art – Elisabeth Brockmann, “Kronach leuchtet”
46	<b>lux:</b> CURIOSITY	Pupate: mycoocoon
47	<b>lux:</b> SOURCE	Flashing blue light
		Imprint

## Multi-layered



The Fresnel pendant luminaire by Dutch designer Dirk Vander Kooij bathes everything in a golden light. The associations with the Fresnel lens suggested by the choice of name are explained by the similar effect produced by this luminaire with its layered structure and by the lenses arranged in a ring shape. The warm, pleasant light produced by 360 LEDs penetrates the countless layers of this "lampshade", making for a special kind of aura. The idea that pieces of shredded plastic from discarded fridges can produce this feeling of well-being is initially confusing. However, the award-winning artist has for years now been using an out-of-service robot that he has converted into a 3D printer to make furniture and luminaires out of recycled plastic – sustainable and with their own aesthetics. [www.dirkvanderkooij.nl](http://www.dirkvanderkooij.nl)



Photos: Studio Dirk Vander Kooij

## lux: HISTORY

## The trend towards miniaturisation

In the past the concepts designed for the retail market were based on a high degree of illumination, even for ground-level lighting. Not infrequently the average level was around 2,000 lux, with a power input of more than 45 W/m<sup>2</sup>. The important highlighting of products on a level with people's lines of vision could only be achieved using powerful lighting systems. Many concepts called for the use of HIT 70 W lamps. Using the old technology the spotlight systems needed to have correspondingly large dimensions. Often, the spotlights on power rail systems consisted of two visible components – the equipment housing and the spotlight head itself, equipped with the bulb and reflector technology. By contrast, current innovative lighting concepts adhere to a certain basic energy-related concept, achieving a good presentation of products that promotes sales



despite a considerably lower power input, one of less than 20 W/m<sup>2</sup>. The relevant concepts are usually very rich in contrasts: With a low basic level of illumination (between ca. 600 and 1,000 lux) the customer's gaze is directed by the strong accentuation of the goods and of the rear walls or displays, allowing retail space to be transformed into a stage.



Performance and efficiency united in this small, elegantly designed model, Canilo (left). Its predecessor Scenic Flat (right) required considerably more space.

With the current LED technology product developers are in a position to implement lighting systems in small areas. An example is Canilo, a new generation of spotlights boasting an impressive miniaturized, cylindrical design with a diameter of only 105 millimetres. The heat management system, synchronized with the integrated LED technology,

and the replaceable optics made of highly reflective MIRO-SILVER (total reflectivity of up to 98 percent) allow for luminous efficiency of up to 2,830 lumens. This corresponds to 91.3 lm/W with a system output of only 31 watts. All the important luminous colours from 2,700 to 4,000 kelvins are standard with a colour rendering of up to CRI 95.

## Flashlight concerts

### Choice of dates

- 04.08. Zingst, Am Kurhaus
- 08.08. Boltenhagen, Freilichtbühne
- 29.08. Bonn, Poppelsdorfer Schloss
- 04.09. Dresden, Großer Garten
- 12.09. Berlin, Waldbühne
- 18.09. Frankfurt, Weseler Werft
- 02.10. Leipzig, Geyserhaus
- 03.10. Zwickau, Freilichtbühne
- 04.10. Gütersloh, Mohns Park
- 09.10. Storkow, Burg Storkow



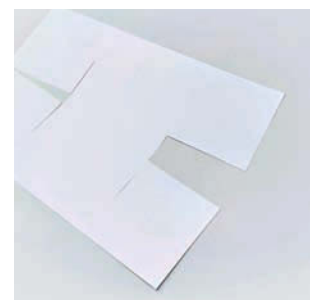
Photos: Uwe Hautth

A simple idea from 1998 and a concert with only a small audience have now metamorphosed into an annual nationwide tour. At their pocket torch concerts the Berlin-based group of artists Rumpelstil entertains the whole family with their special musical compositions and plays, diverting the audience with a mixture of Swing and Rock music for people to sing along and dance to. The concerts always start in the daylight hours and finish in the dark with a sea of 1,000 small pocket flashlights. And every individual contributes to the success of this scintillating experience in which, until the beginning of October, attendees can play an active part. Younger concertgoers in particular take great pleasure in transforming the stands into a sea of lights.

[www.rumpelstil.de/taschenlampenzert](http://www.rumpelstil.de/taschenlampenzert)



Photos: Yasuko Furukawa



## Artfully folded

Architect Naoki Ono and industrial designer Yuki Yamamoto established a Japanese design studio, Yoy, in Tokyo in 2011. Since then they have been making waves, with many exhibitions in Tokyo, Moscow, Milan and Singapore, and have scooped a number of awards. Their luminaire Poster represents yet another coup. Both the luminaire's formal vocabulary and its construction are surprisingly simple and minimalist. Supplied as a space-saving folded A2 poster available in a single colour, patterned or upon request with the buyer's favourite motif printed onto it, it is fastened to the wall with poster strips, drawing pins or sticky tape. It can make an opulent or dominant impression or seem understated, almost dissipated. The illuminant is a small LED lamp – what else? A clever idea. [www.yoy-idea.jp](http://www.yoy-idea.jp)

## Sculptural embrace

The MUHC (McGill University Health Centre) in Montreal is one of Canada's best-known health centres. Linda Covit has now designed a sculpture, Havre, for the complex's main square. This lotus-blossom-like object is almost 16 metres across and 13 metres high, made of tubular aluminium and meant to be welcoming and to symbolize a feeling of safety and security. In the daytime this accessible sculpture is the stage for the interplay of light and shadow, changing depending on the time of year and day. In the evening and at night the artwork is bathed, at 30-minute intervals, in different shades of blue and green, colours evoking the elements of air and water. With relatively little technical effort – programmed LED projectors – this creates a shimmering oasis.

[www.sculpture.org/lindacovit](http://www.sculpture.org/lindacovit)



Photos: Marc Cramer



Photo: Bolichwerke

## Redefining fluorescent lamps

With his unconventional interpretation, young designer Jakob Frank won the Bolichwerke competition for a luminaire design. The jury was taken by his novel combination of crafts, art and innovation. "Konzept 6" blends the tradition of metal decorating with an unusual, vertical suspension for a fluorescent lamp. Competition participants were challenged to "design a classic" while focusing on design, comfort, technology and innovation. Like many great classics, Frank's design is the coherent realisation of a simple structural idea. Together with the manufacturer, the luminaire will now be fine-tuned ready to go into mass production.

[www.bolichwerke.de](http://www.bolichwerke.de)



Photo: FSU Jena/Kasper

## Jena – city of light

Jena is playing a particularly notable role in this, the International Year of Light. Whilst throughout the world countless special and unique events are taking place, the city of Jena only has to remember what it is and can beam with pride. This city of learning has been renowned for innovative, light-based technologies for more than 150 years now: the flashes of genius demonstrated by the city's trio of inventors, Carl Zeiss, Ernst Abbe and Otto Schott, its research establishments and its world-famous high-tech companies. Within the framework of various exhibitions and events at key locations such as the Optical Museum and on "light walks", in 2015 visitors can discover the shining success story of Thuringia's second-largest city. Here, light always symbolizes both a tool and a research object. [www.lichtstadt-jena.de](http://www.lichtstadt-jena.de)

## lux: STATEMENT

### Staging (with) light

Light plays a central role in retail. It can make colours glow, effect sharp contrasts, energize or soothe, as well as stage products and focus shoppers' attention on them. The prerequisite for a successful lighting concept is close cooperation between client and lighting planner. To this end our consultants conduct an individual analysis to determine the target group, investigate the client's corporate identity and the architecture of his retail premises. This is the only way for the planner to draw up a customized concept in which the light creates the right kind of atmosphere and the brand image is optimally underscored. In the course of our holistic consulting process we not only review efficiency, colour rendering and light distribution, but also the way that light is perceived and how to guide customers.

This allows us to swiftly identify the potential for improvement. Only then is the product chosen, one for which the client can rely on a long lifespan thanks to Oktalite's high quality standards. Our five-year guarantees can be adapted individually and offer additional protection. In the concept planning process every luminaire is then accorded a predefined function. This might be to illuminate a product, an exhibit or an architectural feature. However, after installation spotlights and luminaires are not always ideally positioned and then do not fulfil their functions as they should. A competent partner such as Oktalite – a member of TRILUX Simplify Your Light – also provides assistance with these finishing touches. After all, every retail sector has its own demands and needs a requirement-oriented service.



Stephan Renkes  
Head of Research & Development  
Oktalite Lichttechnik GmbH,  
Cologne, DE



Photo: Oktalite



Photo: John Horner Photography

## Tempting light swings

Eric Höweler and J. Meejin Yoon, the founders of Höweler + Yoon Architecture / MY Studio, emphasise the inclusion of social, artistic and ecological aspects in all planning processes. For their project in south Boston the question was how to enhance the appeal of the outdoor area of the seemingly anonymous residential quarter and improve the quality of life there. Their answer: Swing Time, an interactive playscape with 20 luminescent ring-shaped swings of different sizes. A micro-controller sets the LED light in the rings: When stationary they gleam in soft white, when in motion this then changes to blue through purple. The result is a colourful sea of light with a communicative feel and offering a lot of fun.

[www.hyarchitecture.com](http://www.hyarchitecture.com)

## Creatures of light



Photos: American Museum of Natural History, New York



The special exhibition at experimenta Heilbronn addresses the desire expressed by UNESCO to underscore the importance of light to life on Earth, to science, technology and culture. Until 2 August 2015 visitors can experience the show *Creatures of Light* from the American Museum of Natural History, New York – and discover various habitats in the dark revealed by means of light and sound. Here, large numbers of mysteriously luminescent creatures divulge the purpose and genesis of bioluminescence. Moreover, the show presents the latest scientific findings as well as some fascinating research portraits. Real specimens, detailed models, some of them larger than life, films and interactive installations are aimed at opening viewers' eyes to the thrilling cosmos of glowing organisms.

[www.experimenta-heilbronn.de](http://www.experimenta-heilbronn.de)



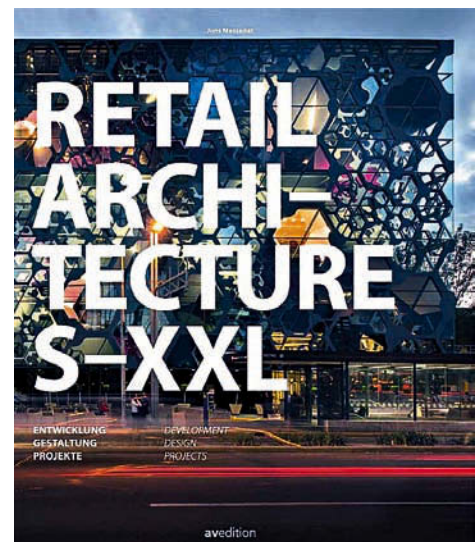
**Nakis Panayotidis –  
Das Unsichtbare sehen**  
exhibition catalogue  
Kunstmuseum Bern (editor)  
Matthias Frehner und Regula Berger  
Published in 2014  
by Scheidegger & Spiess  
312 pages, 141 illustrations  
24 x 24 x cm, paperback  
German, English  
€ 48,00  
ISBN 978-3-85881-444-9  
www.scheidegger-spiess.ch



The catalogue published to mark his solo exhibition at Kunsthalle Bern extensively presents the work of this Greek artist, who follows in the tradition of Arte Povera. On show are both Nakis Panayotidis' early oeuvre and his current work, pictures, photographic installations and objects made from stone, metal, asphalt, lead, fabric, electric bulbs and neon lamps. The artist repeatedly investigates light and transience, myth and everyday life, reality and illusion; the incidental fascinates him as much as the ephemeral, hence his predilection for light and water vapour. His work will be on view until September 2015 at the Museo d'Arte Contemporaneo in Rome.

**Retail Architecture S-XXL**  
Jons Messedat  
Published in 2015  
by avedition  
224 pages, 284 illustrations  
24 x 28 cm, hardcover  
German, English  
€ 59,00  
ISBN 978-3-89986-213-3  
www.avedition.de

In an age of virtual trading platforms, customers expect real stores to offer all the more. This book shows how current trends influence international retail architecture. Alongside chapters on the history of retailing, the theoretical section gives an outlook on the future mixed-use model, which combines different functions such as living, working and leisure time under a single roof. The book also addresses the importance of materials, colours, and light in designing rooms and their ambience. An extensive practical section discusses realised projects, from Berlin's "Unverpackt" supermarket (with 70 square metres of retail space) through to the Emporia shopping mall in Malmö, Sweden (with a total of 20,000 square metres).



**Brockmann – Glück**  
Alice Arnold-Becker  
Hans-Jürgen Buderer  
Published in 2014  
Published by the  
Town of Friedberg  
103 pages, 60 illustrations  
19,5 x 26 cm, hardcover  
German  
€ 19,80  
ISBN 978-3-00-047978-6  
www.kunst-am-bau.net



"Glück" is the name of the project commemorating the 750<sup>th</sup> anniversary of the City of Friedberg in Bavaria for which Elisabeth Brockmann placed back-lit portraits of icons at eight different stops. She was inspired by the faces of the "city's icons", scarred by the passage of time but still highly expressive. The artist placed the out-sized enrap-tured, suffering or resigned faces of the saints on back-lit panels. Framed in a way and in a size that fits the carefully selected historical facades, they confront the passers-by with the pathos of a past age. The publication of the same name serves above all to document the installation, which is temporary, and also explains how it came about.

# LEARNING FROM MUSEUMS

An exhibition becomes a display window, a display window for orchestration purposes, orchestration of the exhibition. Types of buildings such as museums and shops, which at first are so very different do actually have quite a bit in common, not only in terms of lighting technology.

Carla Wilkins

Selling is all about presentation. And presentation is the essence of museums. The purpose of museums is to preserve a product, in this case cultural assets in its different guises, to present it correctly, provide visitors with the relevant information, and put the product in context with regard to the history of art. Light plays a pivotal role in this. The highest demands are made of the right lighting, far beyond the reproduction of colours and the strength of the lighting in question. The presentation of the relevant objects can take different forms, from documentary to orchestrated. At Kunstgewerbemuseum Berlin, Berlin's Museum of Arts and Crafts, the architects Kühn Malvezzi opted for presentation in the form of a display window.

In the world of retail what is important is the optimum presentation of a product. The objective is to grab the attention of the viewer and potential purchaser. The first step is to command the viewer's visual attention and to focus it on the article. The emphasis here is on materiality, volume and quality. For the first few seconds, the associations the customer makes

when looking at the product trigger emotions and memories, rendering the next step possible – further interest. The experience surrounding the product is intended to play a communicative role. As part of the Leica Camera project in Wetzlar with architects Gruber + Kleine-Kraneburg, the aesthetics of the Leica brand are transferred to architecture and the type of sequences of rooms that people are allowed to experience. The Leica leitmotifs – a focus on essentials, attention to detail, a love of precision and design – become tangible. The viewer has an opportunity to gain access to the product at his own pace. Light planners are aware of the components for optimum illumination of rooms and objects, of the exact proportions between the intensity and quality of light in the interplay of volume and materiality. In retail, the presentation of products is determined by the brand's aesthetics and the outlook on life that it wishes to convey. The lighting interprets these parameters, becoming the tools for creating the appropriate atmosphere.

Exhibition or shop? A museum with display window character.



Perfect presentation evokes memories and a desire to buy, or rather a desire to find out more about a product. The possibilities the world of online shopping offer are calling this classic approach into question. In this case excellent product photography orchestrates the visual stimuli that light produces and fosters, with customers buying and taking advice from the digital community. By way of contrast, the real world of shopping has the advantage that customers receive direct feedback based on their own values and quality standards. This, however, is no longer enough. The interior design in retail premises make it possible to relate a brand's history, with lighting guiding shoppers' perceptions. It is about communicating a product or a group of products and expressing a certain attitude to life. The messages sent out to the customer need to be controlled. Here, economy of attention is becoming increasingly important. The sensory and informational overload as a result of a surfeit of visual impressions requires curatorial direction. In other words, alongside

the pleasure of touch, the real in-store purchasing experience needs additional value added. In future it will be important to create a personalized interface between the worlds of the digital and analogue shopping experiences. The progress in lighting technique offers enormous opportunities here; LEDs have become well-established. Over the past years light planners and the luminaire industry together emphasised the main points. After the initial euphoria, the lifespan of LED light bulbs has proved to be reliable, with new technologies allowing their performances to be monitored, such that project-specific and increased lifespans can be guaranteed. Ballast units are currently the difficulty, but this problem is well-known and is being addressed and improved by industry. The output and the available lumen packages allow use in most applications. Even beam angles in the region of less than 10° appear, at the moment, increasingly likely. However, there is currently still room for development. With the constant improvements to LED modules, even the size of the cooling

Retail or museum? The new headquarters of Leica Camera AG in Wetzlar offer not only exhibition space but also a flagship store.

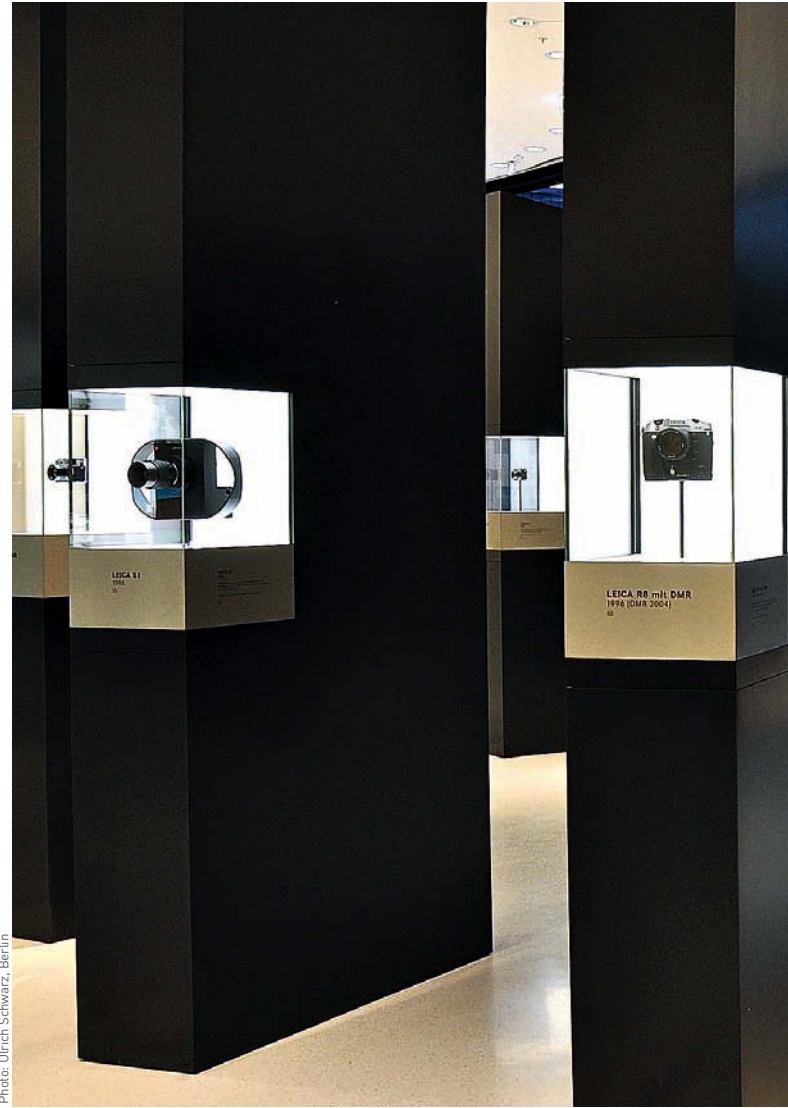
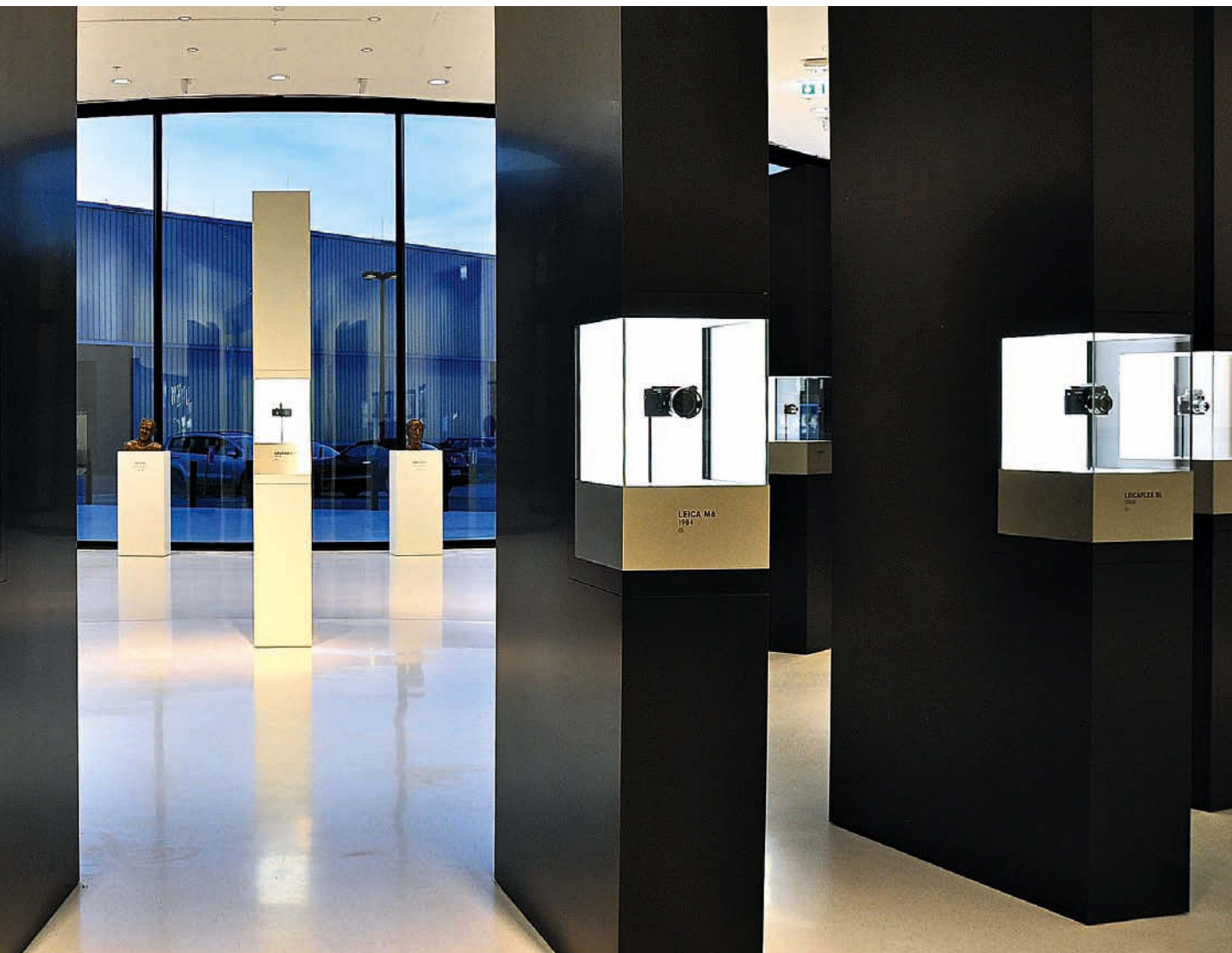


Photo: Ulrich Schwarz, Berlin

element can be reassessed; an intelligent constellation allows for further miniaturization of the technical elements. This component has a major impact on the size and design of luminaires. The importance of the quality standard of a very good colour rendering index ( $R_a$ ) larger than 90 is no longer a niche product but is reflected in many of the portfolios in the lighting industry. Here, the trend is towards a detailed examination of the individual reference colours. Moving away from the classic average value using the 14 reference colours, lighting planners' requirements are developing in such a way that each individual value must reflect a colour rendering index of more than 90. The discussion about the tolerance is becoming increasingly important. This is the only way that the observer's comparing eye can comprehend and evaluate tolerances in the light on materials, because different LED lights made by various manufacturers with the predefined colour temperatures of, for example, 3000 K may possibly vary slightly. The influence on the perceived result might

confuse the viewer and impact negatively on presentation. For this reason the problem should be pointed out and, in future, be taken into better account in the tolerances. LED technology has now reached a point where it can allow various different colours of light to be placed on a chip; RGBW modules offer a possible way of taking account of the targeted use of colours and shades of colour in the relevant concepts. Lighting technology must promote these individual criteria and concentrate them for the lighting modules. What is important in this respect is that in practice great flexibility is called for, but as far as handling is concerned the maxim "keep it simple" must be abided by. The light fixtures are only one component of the lighting concept. Operating the lighting will play an increasingly important role on the sales floor. This allows not only for azimuth-dependent lighting scenarios in interiors parallel to our perception of the shifting light of day, but also for dynamic lighting colour designs, as in the A10 shopping centre in Wildau. The future lies in the creation



of interactive possibilities, for example, being able to offer customers in shop changing rooms different lighting moods with lighting technology that replicates differing everyday scenarios. Moreover, there are other areas, such as, for instance, display windows that can be given more value added by means of dynamic lighting technology. Involving customers by means of interactive controls allows for additional new design scenarios. Lighting planners curate the options lighting-technology provides, evaluate and prioritise them for the shop floor or for the sequences of shop floors. Working as a team, architects and interior designers, plans for an appropriate light-orchestrated rhythm for the world of the shopping experience need to be drawn up. In this respect, economic and responsible plans with regard to energy and material resources should be a matter of course. The objective is to create a place for and with the product, that strengthens the brand and remains in people's memories in a positive way – so that the product a buyer and vice versa.



#### **Carla Wilkins**

studied Architecture and has been working in lighting planning since 1989. After stints in New York and Berlin she was a founding partner of the international planning studio Lichtvision Design & Engineering GmbH. Here she is primarily responsible for concepts and designs. She is a member of Werkbund Berlin and of IALD, the International Association of Lighting Designers, and she gives regular lectures on the subject of lighting design. [www.lichtvision.com](http://www.lichtvision.com)



# WHOLESALE



Cargo ship in the harbour, Asia, Photo: © iStockphoto.com/TERADAT SANTIVIVUT

**“What an individual cannot achieve can be achieved by many.”**

Friedrich Wilhelm Raiffeisen (1818–1888), German social reformer



# THE PARTS AND THE GREATER WHOLE





Floating market, Mekong River Delta, Vietnam, Photo: © iStockphoto.com/Bartosz Hadyniak

**“All things great are accomplished by the acts of individuals.”**

Thucydides (around 455–396 BC), Greek admiral and historian

# LOOKED INTO

3lux:letters asked three lighting experts three questions on light and retail.



**Mona Khmais**  
**Light designer, architect**  
**JK Lighting Design GbR, Büttelborn, DE**

**How do you integrate daylight and artificial light into your designs in general?**

**Mona Khmais:** That of course depends on the particular project, because not all light is the same. Light is dynamic, varied, and atmospheric. Whenever natural daylight and artificial daylight complement each other in a purposeful way, there is a tangible rise in the quality of the ambient surroundings. The visual link with outside – which provides information about the direction, brightness, and intensity of the light – is an important pace maker for the human organism, and as such for our biological clock. Selected types of luminaire, their arrangement in a meaningful way, the integration of opportunities for providing shade, and the consistent use of smart light control play a role here. It also pays off economically in the form of increased productivity and lower operating costs.

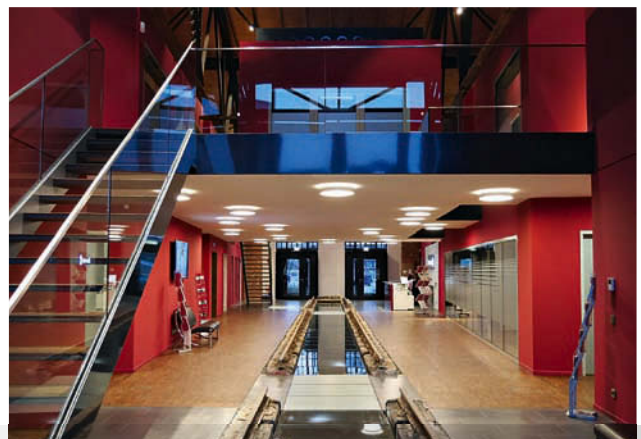


Photo: JKLD

Office building in the former engine shed in Bad Homburg; Germany



**Guido Trampitsch**  
**Architect**  
**Söhne & Partner Architekten, Wien, AT**

**Guido Trampitsch:** Architecture and light are very closely associated with each other. In this context a quotation by Bruno Zevi occurs to me: "Light is an architectural form". The plasticity of a space and its structure are heavily dependent on its lighting. We are constantly searching for multi-layered lighting atmospheres, with both natural and artificial light. Spaces need overlays, division into zones – and these can often be made by playing with light. This arouses curiosity, creates surprises and is an invitation to discover the space's architecture. We also integrate light with a view to emphasising or changing the dimensions of a space. At the same time this increase the significance of the individual objects and shapes in the space. Every type of light – be it daylight or artificial light – has its own orientation, intensity, colour, warmth or coldness – all these factors have to be taken into consideration in the planning process.



**Katja Winkelmann**  
**Light designer**  
**Licht 01 Lighting Design, Hamburg, DE**

**Katja Winkelmann:** With every project the impact and influence of natural daylight has to be evaluated and planned. In shopping malls, for example, it is important to think about the proportion of natural daylight. In areas with a great deal of natural daylight, the incidence of light needs to be controlled so as to avoid too strong glare and too high lighting strength. The shops in a mall have to be able to present themselves in the best possible way, so the level of lighting in the display windows should be greater than that of the mall. The colour temperature of the artificial light is also important. Like the level of lighting, this is adapted to suit the relevant natural daylight: By day, when natural light has an extremely cold colour temperature and a level of illuminance, the artificial light on the inside is managed in the same way. At twilight, when the outside illuminance is lower and its colour temperature is warmer, the light on the inside is adapted accordingly.



Hotel Caldor in Münchendorf near Vienna, Austria



Liedloff Store in Hamburg, Germany

Photo: Severin Wurnig

Photo: Pepe Liedloff

**To what extent does the corporate design or image of a brand influence the lighting planning of the sales area and the entire building?**

**Mona Khmais:** The influence wielded is considerable, because it is about creating spaces for experiencing things that entertain visitors while at the same time conveying a message. Light is used to rouse emotions and, by extension, to create brand identities. Light planned in an intelligent way can act as a sales impetus and promote turnover. Depending on the company and product there are clear guidelines with regard to lighting appliances, colour temperature, colour reproduction, and illumination strength. There is of course still freedom of choice as regards the choice of luminaire type and where they are positioned. However, vibrant light scenarios with varied sequences form part of the guidelines, and show that the lighting concept and lighting control must be seen to be, and treated as a unit.

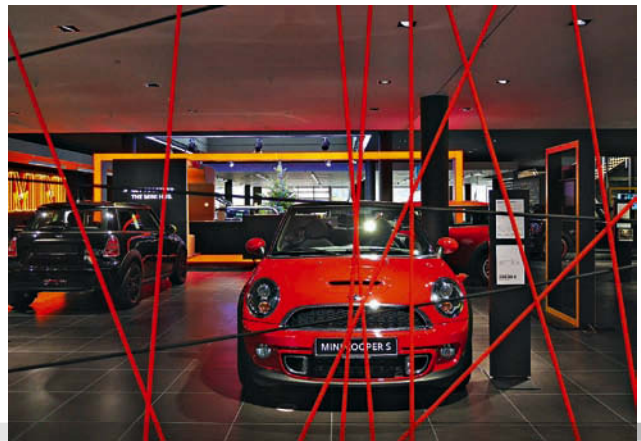


Photo: JKLD

BMW Mini flagship store in Frankfurt/Main, Germany

**How do you think lighting planning will develop in the shop and retail sectors?**

**Mona Khmais:** The revolutionary development of the LED has opened up new technical opportunities for orchestrating selling space by means of illumination: Being able to regulate brightness and the colour of light, and the different visual features of LEDs provide greater creative leeway in light design. Facades, display windows, and exhibition areas are used as brand ambassadors. They appeal to passers-by, waken desires, are inviting, and trigger an urge to make a purchase. Light colours, accentuations, and momentum used in a specific way concentrate attention and make shopping an experience.

**Mona Khmais,**

born in 1968 in Cairo, Egypt, she studied Architecture in Valencia and Hanover. Having worked in the communication agency Atelier Verfürth in Hanover and a luminaire manufacturer, in 2007 together with Dirk Justus she founded the light design studio JKLD – JK Lighting Design – in Büttelborn in Hessen, Germany. [www.jkld.de](http://www.jkld.de)

**Guido Trampitsch:** As already mentioned, architecture is never merely a space itself. Light in particular is especially important in strengthening a brand's image. Light colour and effects are ideally suited to accentuating a brand. In high-end selling space the dominant lighting atmosphere creates a more intimate, more up-market ambiance. Light also plays an important role in customer's purchasing behaviour. However, it is almost imperative for the lighting atmosphere to be carefully coordinated with the brand's image, and for it to enhance it as well. The light, the space, the surfaces and the technical subtleties must come together to form a coherent whole and create a pleasant, appealing overall impression, which encourages customers to make a purchase, and which supports and continues the brand's corporate design.



Restaurant Comida y Luz in Vienna, Austria

**Katja Winkelmann:** A brand's corporate identity (CI) exerts an enormous influence on light design: From the outset the brand itself, the relevant interior design, as well as the branding need to be considered in the design, as different brands have different concepts with regard to fittings and sales. It makes an enormous difference to an image if there is even, bright basic lighting, or very accentuated lighting directed only at goods or displays. What is also important though, is that the colours of the space and the goods strongly influence the impression the space makes. Light with a consciously planned impact inflates the desired effect and presents the goods as well as possible. If the corporate identity features a specific colour, the light can reference it as well.



Olympus showroom in Hamburg, Germany

**Guido Trampitsch:** I can well imagine things becoming simpler. In concrete terms I am thinking here of a reduction in lighting effects and light control. The main topic here has to be light being easy to operate, making light more the focal point. At the same time, inter-activity is increased. Perhaps the light colour in changing cubicles will change to suit the piece of clothing being tried on? Wholly in line with the saying "leisure clothing = daylight atmosphere, evening gown = elegant evening atmosphere". That is just one example, but it demonstrates that new retail concepts could certainly be viable with lighting atmospheres. Integrated chips in clothing and interactive mirrors could make these scenarios possible. As another trend I see greater differentiation between luminaires used for effect and "real" lighting, and using the former purely as design elements.

#### **Guido Trampitsch,**

born in 1970 in Zweinitz, Austria, he studied Architecture at the Technical University in Graz, in Sydney, and New York. In 2003, together with Thomas Bärtil and Michael Prodingler he founded Söhne & Partner in Vienna; he focuses on hotels, offices, and public buildings, as well as interior design. [www.soehnepartner.com](http://www.soehnepartner.com)

**Katja Winkelmann:** Lots of shops were designed with extremely high illuminance throughout, not just in the display windows but in the shop itself. Aisles and sales areas were almost as bright as the goods, such that even more light was needed to accentuate them. Fortunately there has been a change in the "the brighter, the better" mentality: Shops are now illuminated with greater accentuation and differentiation, giving rise to different scenarios and atmospheres. Unfortunately, lots of shops are now "somehow" being converted to LED, meaning that poor light quality and colour reproduction often go hand in hand with high glare levels, and that the light quality – and thus the atmosphere as well – in the shops is deteriorating. I hope that shop owners and interior fitters understand just how important quality light design is, particularly when it comes to the use of LED light sources.

#### **Katja Winkelmann,**

born in 1970, she has worked in various light design and interior design studios. Parallel to her subsequent work as a freelance light designer she studied Architecture at Hamburg University of Applied Sciences (HAW). Since 2001 she has run her own studio Licht 01 Lighting Design in Hamburg, and she is a member of the International Association of Lighting Designers (IALD). [www.licht01.de](http://www.licht01.de)



# A GOOD LIGHT

With its Kö-Bogen shopping centre, the City of Düsseldorf has taken its first successful steps towards redeveloping its downtown. Studio Daniel Libeskind has reactivated the historical link between Königsallee and the Hofgarten, designing two buildings with sweeping geometries. Breuninger, a department store that moved into new premises on Königsallee (Kö) at the end of 2013, is one of a whole string of illustrious tenants.

Lasse Ole Hempel



For the basic lighting the planners rejected downlights and opted for elements producing a striking visual effect.







The lighting planners arranged the Cardan series spotlights into triangles to create the illusion of halos on the product display tables.

A shopping experience, Kö-Bogen, designed by Daniel Libeskind's architectural office, is part of the new focus being given the area around the famous Königsallee, liberating as it does the adjacent ensemble consisting of the Dreischeibenhaus tower block and the theatre from their isolation, and reforging the historical link to the Hofgarten. Since opening in February 2014, the new shopping centre with its greened roofs and rhythmically alternating whimsical façades has not only been well-received by the locals but has also impressed specialist juries – the Kö-Bogen project won the MIPIM award in the “urban development” category and has been presented with the Green Building Council's LEED certification. The retail units were all designed in close consultation with the relevant tenants, all, without exception, in tune with the Kö's reputation as home to luxury retailers. A department store, Breuninger, set the ball rolling when it moved into new premises in the shopping centre at the end of 2013. Straddling more than 15,000 square metres across five floors, this fashion and

lifestyle store sells exclusive design brands and boasts the largest shoe department in North-Rhine Westphalia. The store was styled by Liganova, a Stuttgart-based interior designer. Its sweeping track lighting in contrasting colours guides shoppers through the store, creating a generally pleasant atmosphere and offering optimum guidance along the way. The lighting concept, courtesy of rühle.lichtplan, underscores the interior decorators' approach, organising the luminaires into groups which lend the store a visual flair all of its own. For the basic lighting, the bureau rejected downlights, opting instead for Cardan Solo spotlights by Oktalite. Arranged into triangles they produce the illusion of a halo on the product display tables. For the periphery, the planners chose Sistema with a modular construction. With this luminaire the modules and lighting technology can be replaced without tools and without any alterations to the fitting itself. In other words, users can change the in-built lights if so desired and even transform them smoothly into spotlights.



Elements with integrated lighting but different shapes bring life to the ceilings – featuring organic curves (above), or expansive angular sections (on the right).





With its purist design, the outdoor lighting, ConStela LED by TRILUX, traces the picturesque water course of the river Düsseldorf.

**Location**  
Düsseldorf, DE

**Client**  
Breuninger GmbH & Co.  
Stuttgart, DE

**Light planner**  
rühle.lichtplan,  
Immenstaad, DE

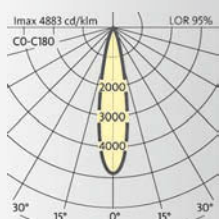
**Luminaire**  
Oktalite – Member of  
TRILUX Simplify Your  
Light: Sistema, Cardan  
Solo

**Photos**  
Uwe Spoering,  
Cologne, DE  
TRILUX, Arnsberg, DE

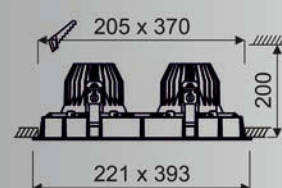
lux: TECHNOLOGY

## Sistema

As a modular built-in system Sistema offers flexibility and many possible combinations, particularly for retailing. The available versions: not only single, double and triple-cell fittings but also built-in Cardan spots. Installation is completely tool-free, from fitting to the light module, ensuring ensures trouble-free handling. Replacing and combining different modules and lighting technologies is thus very easy and smooth, even after installation. Just as is switching from HIT to LEDs. Moreover, there is another additional module on offer, the Scenic Plus Mini. The head of this basic luminaire rotates through 90° and can distribute light with utmost precision, presenting products in an ideal light.



Luminous intensity distribution



# AN APPETIZING LIGHT

Jelmoli, Zurich's largest premium department store, is located only five minutes' walk from the main train station. After a brief conversion phase, its gourmet department now boasts a new look – and presents itself in the best possible light. With a footprint of over 2,000 square metres, the redesigned food market in the basement now offers a choice range of foods and wines from all over the world.

Nathalie Martin





The lighting underscores the natural colours and radiance of the displayed goods, the ice makes for fascinating reflections.



Originally established in 1833 by Johann Peter Jelmoli-Ciolina as a fashion business, the shop was transformed into a department store in 1898 at its present location on Seidengasse: as a “glass palace” along the lines of similar stores in Paris and London. The historical building was completely refurbished in 2010. Today the shop-in-shop gallery presents a wide variety of different brands under the name of “house of brands”, from fashion to interiors and even includes a top-flight food section. This department offers tasty delicacies from both national and international suppliers, housed in a modern interpretation of a food hall. One particular highlight is the first cheese humidor in Switzerland – a walk-in cheese cellar with more than 250 types of cheese from the Zurich region, France and Italy that customers can taste directly in fondues and raclettes. The combination of fine foods to go and items to enjoy on location in an inviting atmosphere enhances the food hall – transforming it from a place of pure consumption into somewhere shoppers like to linger. In addition to the high interior design standards, a uniform colour scheme and stylistic vocabulary link the various different areas such as the Mediterranean world, sushi bar, steak point and espresso bar – the planners from Interstore Design combined fittings such as shelves and sales counters which are uniformly black and white with warm wood and cool glass. In order to hide the HVACR system, they had both the

channels for ventilation and technology and the ceilings painted black. The reason why the place is not in any way claustrophobic is because of the light floors and walls – and the cleverly designed lighting. The black Taro and Stratus VS 155 spotlights by Oktalite are discreetly integrated into the ceiling where what they show to good effect is solely the products. Alongside a high degree of natural colour rendering, another point in favour of the LEDs used is their excellent energy efficiency – they utilize only 13.9 watts per square metre. Moreover, the tiny amount of ultraviolet radiation they emit makes these LEDs eminently suitable for lighting delicate goods. The challenge in the redesigned wine cellar: the low ceiling height of 2.60 metres. In this area, and it measures a total of 200 square metres, the designers had a ceiling mirror mounted in order to produce a pleasantly open spatial impression despite the low height. Directed Taro, Taro Mini and Quira spotlights create focal points, highlighting the extensive range of wines and spirits on offer.



A mixture of spots and basic lighting produces a fascinating look to this room (top).

In the wine cellar the ceiling mirror with its integrated lighting conveys a lavish impression (bottom).





**Location**  
Zurich, CH

**Client**  
Jelmoli AG, Zurich, CH

**Light planner**  
Interstore Design,  
Zurich, CH

**Luminaire**  
Oktalite – Member of  
TRILUX Simplify Your  
Light: Taro, Taro Mini,  
Quira, Stratus VS 155

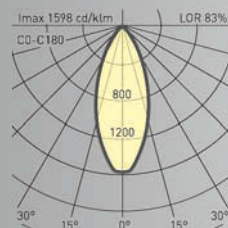
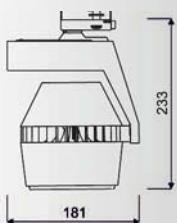
**Photos**  
Daniel Horn, Berlin, DE

lux: TECHNOLOGY



## Taro

Two sizes and five different versions allow for a multitude of uses. The Taro product family comprises add-on and built-in spotlights and an elegant pendant luminaire for LED and HIT technologies. The LED solutions are optimally flexible, with various white light colours and special light spectrums for the food hall. The tried-and-tested interchangeable reflector technology offers three beam widths – from a spot with a narrow beam to soft flood-lighting. This means that with Taro different lighting scenarios can be realised with a uniform ceiling appearance. Moreover, all the LED spots feature segment reflectors made of Miro-Silver<sup>®</sup>, thus guaranteeing the greatest possible light efficiency.



Luminous intensity distribution





# A SPORTY LIGHT

Good lighting is not a matter of luck or chance but of experience and the appropriate lighting tools irrespective of the lighting assignment. However, finding the right solution for generously proportioned shop premises with an unbelievably varied range of products is an especially challenging task. An exceptional solution to a complex brief of this kind was found for Intersport Leffers in Wilhelmshaven.

Ulrich Büttner



Carefully positioned LED spotlights specifically place the focus on individual products.





The restrained design of the ceilings and floors does not compete with the colourful sportswear and outdoor articles

With the opening of Intersport Leffers, this long-standing fashion store acquired a new building for sports and outdoor equipment across a groundplan of some 1,200 square metres. Proprietor Curt Leffers soon agreed with his architect Ulrich Bierwirth and lighting planners Vedder.Lichtmanagement that considering the expected array of brilliant colours it would be vital to present the various product groups in a uniform, neutral setting. Black was chosen as the dominant colour for the ceilings and merchandise fixtures; the flooring is in brownish-grey imitation stone, and only the square supports for the main structure are in white. This provided the right conditions for an effective lighting concept with spotlighting as appropriate and a generally harmonious light. There were no plans to install an enormous range of spotlights and other luminaires for the extremely varied qualities of lighting required. Here too, the desired approach was "as uniform as possible". The lighting specialists finally agreed on Fano, an LED track-mounted lighting system by Oktalite, a company in the TRILUX Group. With a colour temperature of

3,000 K the solution has once again proved its mettle for large retail premises with a complex structure, thanks to its impressive efficiency, colour rendering, perceived light and luminous colour. Fashion expert Curt Leffers soon abandoned his initial reservations about LED light – the brilliance of the product's colours actually exceeded his original expectations; and operating costs were cut much further than with other lighting sources was another important factor in its favour. Fano's versatility delivered further benefits: For instance, the swimwear department and changing rooms boast Fano 2,700 K. The warm colour tone displays skin in a pleasant light, makes for a more intimate atmosphere and creates a sense of well-being. This is important as changing rooms are known to be where consumers make their purchasing decisions. The situation is completely different where the products are presented – in the store itself. There and in the shop windows, in particular, what is needed is lighting that orchestrates products, that is focused in a stage-like manner. All of this was possible with the small, cubic spotlight that is Fano.





In these retail premises, track-mounted lighting system Fano creates pools of light (left page); in the shop windows they produced theatrical effects (top).

**Location**  
Wilhelmshaven, DE

**Client**  
Leffers GmbH,  
Wilhelmshaven, DE

**Light planner**  
Vedder.Lichtmanagement,  
Munich, DE

**Luminaire**  
Oktalite – Member of  
TRILUX Simplify Your  
Light: Fano

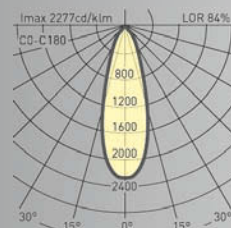
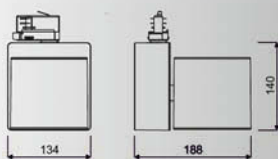
**Fotos**  
Boris Golz, Arnsberg, DE

lux: TECHNOLOGY



## Fano

The Fano track-mounted lighting system is impressive in terms of shape and lighting. Its cuboid appearance hides the necessary cooling fins to create a truly coherent spotlight. At the same time, the product family boasts a high output of 4,000 lumens with luminous colours of 2,700, 3,000, 3,500 and 4,000 Kelvins and Oktalite® Best Colour. There are also various different possibilities for beam widths from spot to very wide flood. The head of this elegant luminaire measures 126 x 126 millimetres and it is 120 millimetres in height. Its little brother, Fano Mini, even measures only 98 x 98 millimetres and is 90 millimetres in height. It has an output of 3,000 lumens, the same colour temperature and beam widths.



Luminous intensity distribution

# PLANNERS ASK, MANUFACTURERS ANSWER

## From production to end consumer: LEDs – universal solution spanning different areas of application?



**Thomas Kretzer**  
Managing director  
TRILUX Vertrieb GmbH

Even in the age of LEDs there is no such thing as an all-round luminaire. Every form of use entails different requirements and focuses with regard to lighting technology. These need to be identified and addressed individually. This becomes clear when looking at the flow of goods from manufacture to sale, and indicates which criteria LEDs need to fulfil for use in various different situations.



### **Production: Human centric lighting and energy efficiency**

In production, alongside energy-efficient lighting, human centric lighting (HCL) – lighting adapted to human biorhythms – is becoming increasingly important. In particular in companies operating three shifts, circadian lighting systems are in tune with people's body clocks, and as such can not only enhance their ability to concentrate and productivity, but also their sense of well-being in the workplace, something that is bound to impact beneficially on health.



### **Logistics: efficiency**

By contrast, when it comes to the transportation, storage and handling of goods the principal focus is only on efficiency. And this applies not only to transport links and architectural planning, with short distances and the optimum use of available space, but also to the lighting. In this instance the focus is on the lowest possible energy requirement, something that can be achieved in part by using strip lighting equipped with LEDs and partly by means of motion detectors – the control system guarantees lighting only in the hall areas in use at the required time.

Efficiency	●	●	●	●
Lighting colour	●	●	●	●
Colour rendering	●	●	●	●
HCL	●	●	●	●
	Production	Logistics	Wholesale market	Sales floor

Usage of and criteria for lighting planning



#### Wholesale market: Colour rendering

When light needs to do justice not only to a single product but to an entire range of products it requires the kind of lighting that boast an optimum colour rendering index. Colour fidelity can be achieved by combining various different shades of LED lighting. These ensure, for example, that shoppers visiting wholesale markets halls are able to see all the different food-stuffs, everything from fruit to fish, in a light similar to that experienced in the daylight.



#### Sales floor: lighting colour

In retail premises individual products are orchestrated. Both the architecture and the interior design and the lighting concept influence the length of time customers are prepared to linger. A specific choice of lighting colours (such as daylight, warm or neutral white), the direction of the light and the beam angle, from narrow to wide create different (lighting) areas, thus making for a pleasant ambiance. Light focused on a single product suggests greater value, boosting shoppers' incentive to buy. Given their extremely low UV radiation, LED lamps are particularly suitable for lighting delicate products such as clothing and food.

Do you have any questions for the experts at TRILUX?  
Then send us an e-mail: [3luxletters@trilux.de](mailto:3luxletters@trilux.de)

# INTELLIGENT LIGHTING

Convenient installation, fast start-up and above all simple planning and operation. These are the wishes of both planners and users with regard to the light management system of the future. TRILUX's response to these wishes in cooperation with Steinel is LiveLink, an innovative light management system.

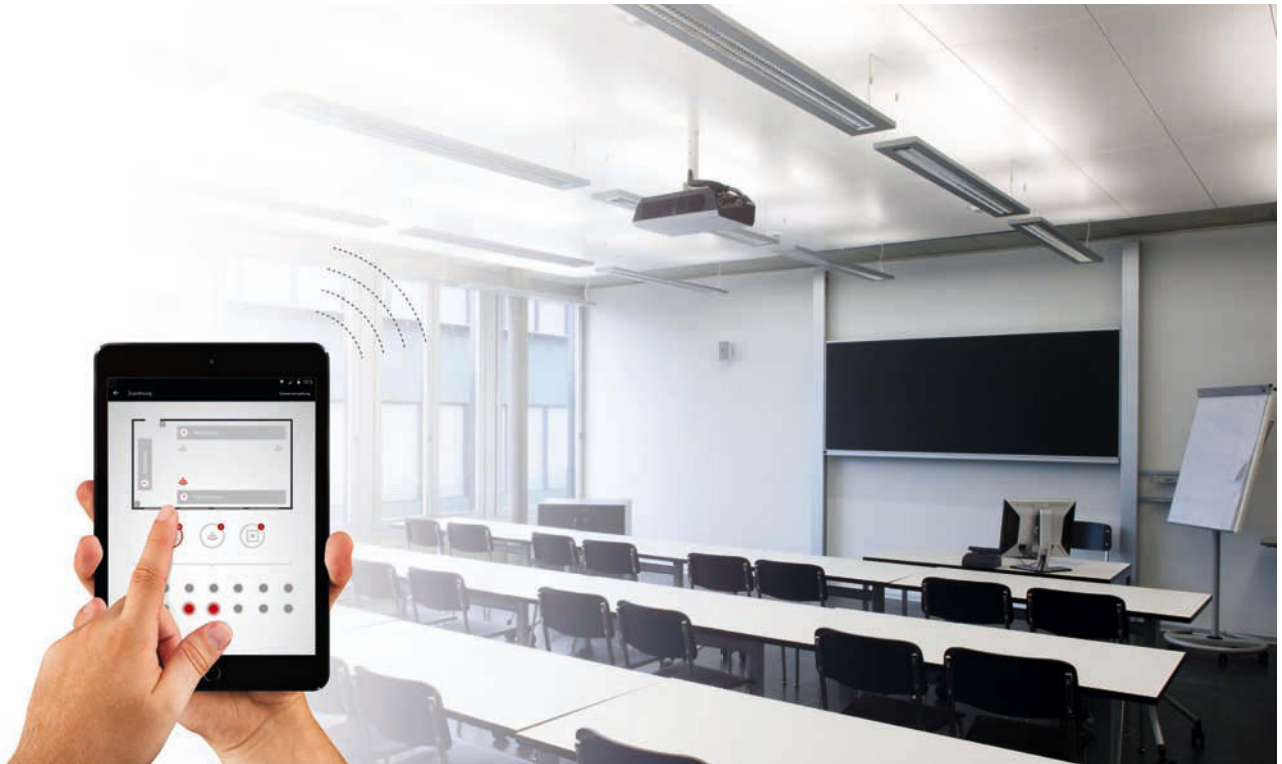
Generally speaking, light management systems have the task either of adjusting the lighting to the prevailing ambient conditions or running a previously set scenario. What sets LiveLink apart from existing systems is firstly the simple planning, start-up and installation as well as the intuitive operation, and secondly the option to subsequently adjust the scenarios created.

Precisely coordinated software and apps make for user-friendly operation. Preinstalled "use cases" (preconfigured application examples) ensure the optimum interplay of lights, sensors and switches and currently cover 80 percent of applications, from offices to schools and hospitals to businesses. And it is not only users who can benefit from LiveLink's sophisticated management of "intelligent light", but also planners. As early as the design phase they can define functions and settings in the preconfigured use cases (or develop a customized solution

together with TRILUX), thus saving planning time and reducing the hitherto complex start-up process. There are pre-settings, for example, for controlling the various (groups of) lights: fully or semi-automatic, via presence detector, via switch, with or without constant lighting control.

Configuration and start-up are run via tablet (password protected) and take just a few minutes. The terminal links up to the LiveLink controller via Wi-Fi and first conducts a DALI bus scan. Here all the lights, sensors and switches in the system are automatically registered and given an address. Then the installer can use drag and drop to assign the lights to the luminaire groups in use cases. In the final step further scenarios can be defined and assigned to the switches. Should requirements change later on, for instance if the space is put to new use, the settings can be easily modified via app. Moreover,





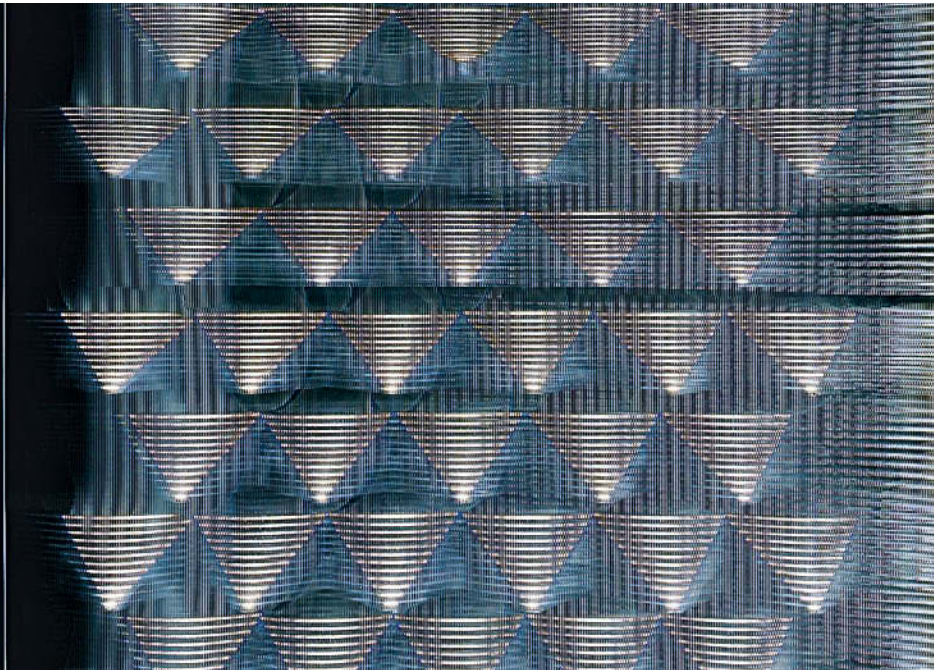
Intuitive and user-friendly operation:  
The LiveLink app ensures simple and  
unproblematic start-up and manage-  
ment of lighting systems.

using additional software a lighting plan created with Dialux or AutoCAD can be inputted and thus individually adapted to users' needs and to the space.

LiveLink is operated either fully automatically via presence detectors or likewise via (password-protected) tablets or smartphones; direct control via switches is also possible. As such, for classrooms or conference rooms the user can select a presentation scenario that dims the programmed lights until the end of the talk. This function is just one of the predefined use cases that TRILUX is constantly expanding and adapting to user needs. LiveLink can also be used in existing buildings: The basic prerequisites are two existing or newly installed DALI lines and DALI dimmable lights.

 LiveLink

Natural spectacles such as rainbows and mirages inspired the artist to produce this work with vectorised light rays.



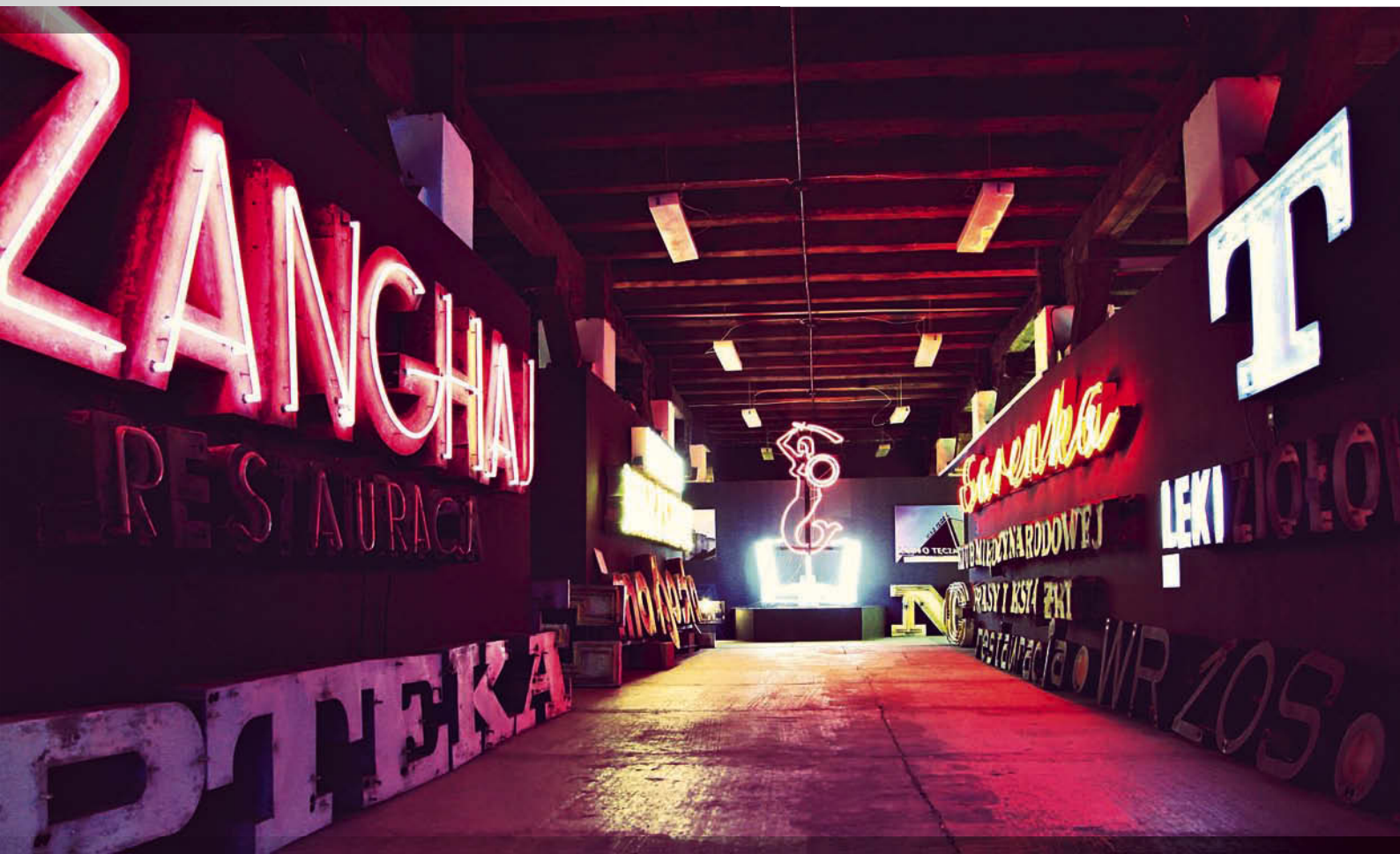
Photos: Pim Top

Photo: Neom Museum

## LIGHT PHENOMENA

... and how we experience them have inspired artist Arnout Meijer to undertake a thorough investigation of the spatial effect of light in the context of human perception.

"Light is a vector projecting a line" – the very title of Arnout Meijer's work for the exhibition "Cohesion", organized by artists' collective Dutch Invertuals, reveals a number of things about its substantive background. The starting point for his piece is rays of light as an essential component of spatial vision and the physical laws that govern them. The Dutch artist is using his installation to challenge his audiences' viewing habits and to take a close look at our understanding of light and its three-dimensional effects. Viewed from the front, the LEDs arranged inside the transparent stele produce a luminous, geometric pattern composed of dots, which gradually become more concentrated and overlap at the edges of people's field of vision. When the viewer moves around the object the overlapping becomes more pronounced and the image acquires depth. Similarly to the case with a hologram, an impression arises of three-dimensional vector rays physically floating in space. For Arnout Meijer the installation is not a finished work, but part of a piece of ongoing research into the effect and perception of light. [www.arnoutmeijer.nl](http://www.arnoutmeijer.nl)



## FIT FOR THE MUSEUM

These beautiful tubes of brightly coloured neon gas have now become museum pieces. In the Polish capital they are seen as works of art and are finally receiving the appreciation they deserve.

Embedded in an avant-garde, living world of art and culture on a former industrial site that once belonged to the Soho Factory, these discarded lighting objects have found a new home for themselves inside a brick hall. The inspiration for Neon Muzeum in Warsaw was provided by documentary photography project "Polish Neon", realised by Ilona Karwinska back in 2005. Finally, seven years later and together with David Hill, she was in a position to implement her idea of pointing out the great artistic value to be found in discarded neon advertising dating from the Cold War era. Most of the work in question was designed by renowned graphic designers, artists and architects. In Socialist times neon lighting in Poland was more than just advertising – its purpose was to inform, embellish the city or simply to light it up. Admiring the results of this kind of work (work that dates largely from the 1960s and 1970s) not only represents a feast for the eyes, but also proves highly instructive. Visitors discover, almost incidentally, just how these bent glass tubes actually work and why it is that they glow in different colours. [www.neonmuzeum.org](http://www.neonmuzeum.org)



## LOOK

Elisabeth Brockmann feels art and architecture are terrain for personal exploration. In her pictures, she reflects on the built world, lending it abstract form beyond simple use.

Initially it was silver-screen greats like Humphrey Bogart, James Dean or Marlon Brando who fascinated the Düsseldorf-based artist. She photographed, enlarged and inserted images of herself into the star's pose, then blew the image up to movie-poster size. A Gerhard Richter student, she later focused on light boxes, those icons of advertising, and backlit both printed acrylic glass and special tarps. Thanks to the influence of natural light, her installations look different as the day progresses, gleaming especially during the blue hour. This is likewise true of her "Lux" in Museum Zeughaus (Reiss-Engelhorn-Museen, Mannheim). Elisabeth Brockmann cut up and shifted the photographed eyes of a display dummy until she achieved the desired effect: It is as if the eyes followed the viewer's movements. Which is an optical illusion: The 50 printed translucent panes of acrylic glass are hung in window soffits, with the light module (fitted with fluorescent lamps) screwed tight.

[www.kunst-am-bau.net](http://www.kunst-am-bau.net)

Daniela Faber created the installation "Grow" for Lichtpunkt 22 (right).

Max Frank Pressig and Jung 4 developed "in Bewegung" for Lichtpunkt 3 (below).



Photo: Alexander Heckmann



Photo: Stephan Amm

Photo: Alexander Vojnovic

## ANNIVERSARY

2015 marks the 10<sup>th</sup> anniversary of "Kronach leuchtet". Each year, for over a week, light-art objects shape the face of the streets in the German city that was home to Lucas Cranach.

The Kronach concept's special feature is the international student workshops, which in the space of only six days generate real light objects. Mentored by renowned planners, the students from Cairo, Turin, Wismar and Leipzig devised ideas for turning buildings, streets and plazas into fairy-tale or horror worlds. Together with changing light artists, such as Daniela Faber with her outdoor piece "Grow" or Paul Göschel with his homage to the light bulb, Coburg University of Applied Sciences and Arts has from the outset also contributed projects: Students place illuminations at some of the 40-odd Light Points, each time highlighting new details of the local architecture. A unique link to this year's event – the 500<sup>th</sup> anniversary of the birth of Renaissance painter Lucas Cranach: Some of his works were projected on frontages. Lucas (Greek for "Bringer of Light") was thus omnipresent. Next year, the festival runs from April 29 to May 8.

[www.kronachleuchtet.com](http://www.kronachleuchtet.com)



Photo: Davide Farabegoli

## PUPATE

Valérie Corcias and Dominique Kelly have come up with a contemporary take on the traditional notion of using light and colour to lift people's moods or promote good health. Using the name mycoocoon, the pair have created a chromotherapeutic space into which people can retire and, depending on their choice of colour, stock up on peace and quiet or energy. An airy, floating screen hides a comfortable sofa where interested parties can lie or sit down and, using a tablet and headphones, embark on their own individually selected colour-light-scent-music trip. Set up in a hotel or at the airport, for example, it allows travellers to put together an anti-jetlag programme which is then transformed by a computer into in direct, bio-compatible light and relaxing sounds. The programme is available in all the colours of the rainbow and the moods on offer range from relaxing to stimulating. [www.mycoocoon.com](http://www.mycoocoon.com)

# FLASHING BLUE LIGHT



Photo: Markus Beck/fotolia

... was originally red light or rather no light at all. The first visual identification for police vehicles dates from 1925. It resembled the later police traffic wand and was attached to the car bonnet by means of a push-on contact. However, awareness of this means of attracting attention was not good and so initially, in 1928, the police opted for a fanfare as an acoustic signal. Headlights with a red light that was admittedly dimmed but nonetheless featured the kind of striking, beam-like red light used by the fire brigade in the ensuing years

were outlawed in 1935 because of the blackout regulations in force. Outdoor light sources were required to be dimmed such that they would no longer be visible from a height of 500 metres. These headlights were subsequently fitted with glass covers in a "dimming solid cobalt blue colour". The reasoning behind this was the belief that blue light diffused best in the atmosphere and was thus invisible to bombers at great heights. However, this was contrary to an effect described back in 1825 by Johannes Evangelista Ritter von Purkinje

when looking at colours. His finding: The perceived brightness of different colours changes as the eye adapts to darkness. This means that in the sunlight red and blue appear equally bright but that in the twilight blue seems brighter. Nevertheless, an edict was issued in 1938 to the effect that all police cars and fire engines should be equipped with acoustic warning devices and identifying blue lights. However, at the time these lights did not flash. It was not until 1956 that flashing blue lights as we know them were introduced. In

the version as a rotating mirror beacon a semi-circular parabolic reflector rotates around a light source; the flashing light version has inbuilt stroboscopic elements flashing at regular intervals with short spaces in between them. Combined with the wailing siren the flashing blue alarm light represents a special signal identifying emergency services vehicles. Blue light is unmistakable and, unlike other colours, may not be used either for traffic lights or for street or road-works lighting, thus fulfilling its own special function.

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### Editorial Staff

Vivian Holtmann (TRILUX)  
Anika Wagner (TRILUX)  
Thomas Kretzer (TRILUX)  
Nathalie Martin (GKT)  
Cornelia Krause (GKT, chief editor)

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### Contacts for architects

Sabine Madaus  
North Germany  
Phone +49 (0) 151.17 11 02 12  
s.madaus@trilux.de

Martin Rohde  
South Germany  
Phone +49 (0) 151.17 11 02 72  
m.rohde@trilux.de

Olivia Lauffer  
Switzerland  
Tel. +41 (0) 56.419 66 66  
info.ch@trilux.com

Richard Holt  
Great Britain  
Phone +44 (0) 12 45.46 34 63  
r.holt@trilux.co.uk

Chris Skinner  
Great Britain  
Phone +44 (0) 12 45.23 63 16  
c.skinner@trilux.co.uk

Lorenzo Clerici  
Italy  
Phone +39 02.36 63 42 59  
Lclerici@trilux.it

Hetty Rümke-de Gier  
The Netherlands  
Phone +31 (0) 33.4 50 71 12  
hetty.ruemke@trilux.nl

Pavel Boucek  
Czech Republic  
Phone +420 235.524 580  
pavel.boucek@trilux.cz