

# lightlife

N° 09

## The Power of Simplicity

Evernote boss Phil Libin knows how to bring structure into today's flood of information

## Lighting Quality in the Office

SEQUENCE – individually controllable lighting solutions are in demand

# User-centered Design

How we use information selectively





Technological and social change has definitely arrived in the light industry. Our most recent studies show the need for innovative light planning at the threshold of digitalisation and before the backdrop of demographic change. We need user-focused design both for our luminaires and control systems as well as our light solutions. Only through consistent user orientation can we create quantifiable and significant added value. To transfer this way of thinking into solutions, application and user research, as well as, interdisciplinary product development have become an essential factor in the development of innovative products that are likewise relevant. This interdisciplinary working and thinking process is also the focus of the current issue of lightlife with the title "User-centered Design".

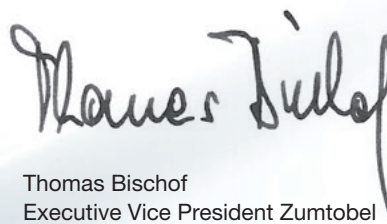
In an interview with Phil Libin we explore the question of organisation of knowledge. He shows how people handle information today and what technology meanwhile has to do in order to offer users tangible added value. The "design" of information is also the subject of scenography. As a still relatively young discipline, it deals with the use of different technologies for the optimal visualisation and imparting of knowledge. Our portrait of Thomas Heatherwick impressively shows how one can creatively use knowledge of space, applications and user behaviour in the implementation of specific products or architecture.

Two new Zumtobel studies provide deeper insight into user behaviour and preferences. The Limbic® lighting study in collaboration with the Gruppe Nymphenburg researches the extent to which target group specific lighting of shop floors has a positive effects on the wellbeing and therefore the activation

of customer groups. The study on "Light Quality in the Office" conducted together with the Fraunhofer Institute confirms that norms and standardised solutions are no longer sufficient for office spaces. In the future, adaptive and intelligent solutions will be needed to respond to the fundamental needs of employees. How we already use this knowledge in projects for the benefit of our customers is demonstrated for example by the L'Occitane store concept in Paris or the new office concept for the Vorarlberg Illwerke. The qualitative research work provides the basis for pioneering product developments such as the highly adaptive SEQUENCE luminaire, the sales-boosting INTRO light system with liteCarve® technology for the retail sector and the open and user-friendly LITECOM lighting control system.

We work together with our customers and partners continuously on the future of light – always with the goal of providing the best light for you and our environment. In the following pages you will experience how user-centered and cooperative design processes lead to better and more effective products and solutions.

Enjoy reading the new issue of lightlife.



Thomas Bischof  
Executive Vice President Zumtobel



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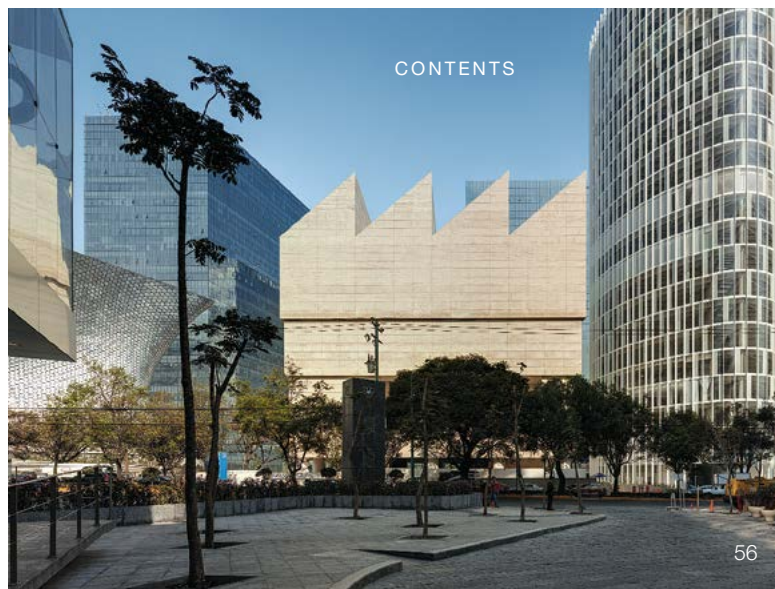
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# Spectrum



product  
design award

2014



## Sustaining Design Culture

Zumtobel products win five awards at the iF product design award 2014

On 28 February the iF design awards 2014 were presented during a glamorous award ceremony at the BMW World in Munich. Once again Zumtobel products convinced the renowned jury – for a total of five awards! Especially noteworthy is the fact that the award for LIGHT FIELDS evolution distinguished not only a single product, but an entire product family. The minimalistic design of the office luminaires, designed by Chris Redfern of Sottsass Associati, is consistently apparent in all of the versions. Featuring innovative LED technology, each of the luminaires provides perfect, non-glare light at all times for different work situations. Other products that received awards were the shop spotlight ARCOS xpert with innovative LED and reflector technology from the ARCOS spotlight family designed by David Chipperfield and the first LED high-bay luminaire GRAFT. The result of a joint development project between Zumtobel and Arup. The remaining two awards went to the finely crafted LED downlight DIAMO with its brilliant light quality and the linear LED pendant luminaire LINCOR, which also received a “Good Design Award” from the Chicago Athenaeum in the USA.

[WWW.IFDESIGN.DE](http://WWW.IFDESIGN.DE)

[WWW.CHI-ATHENAEUM.ORG](http://WWW.CHI-ATHENAEUM.ORG)



**Optimal Light for Optimal Service**  
**Deutsche Bank's outstanding branch concept relies on Zumtobel light solution**

Customer orientation is one of the central corporate values at Deutsche Bank. Market studies and the daily experience of the employees in the branch offices show that the customers especially appreciate competent advice in a comfortable environment. The universal branch concept consequently developed by BEHF Ebner Hasenauer Ferenczy of Vienna has been introduced since 2011 in all European branches and is planned for worldwide implementation. In addition to the choice of high quality materials and a clear design language for effective presentation of the Deutsche Bank corporate design, the light concept developed in close cooperation with Zumtobel also plays a fun-

damental role. This is because the selective use of light design elements effectively enhances the desired separation of the different areas with different atmospheres. The branch concept was already awarded the iF communication design award 2012 and recently received two additional distinctions. The German Design Council acknowledged the outstanding design concept with the Iconic Award 2013 in the category "Interior" as well as the German Design Award in the category "Architecture & Interior Design" with the Special Mention for particularly successful design aspects.

[WWW.GERMAN-DESIGN-COUNCIL.DE](http://WWW.GERMAN-DESIGN-COUNCIL.DE)





### Immaterial luminaire – Completion of Masterpiece with Anish Kapoor is imminent

Zumtobel has always given attention to the importance, the correct use and the effect of light in combination with art and architecture. Light is interpreted not only as a source of luminosity, but as a design element and emotional medium. In this context, long-term partnerships with architects, designers and artists of different disciplines result in the creation of the Masterpieces, which combine a fascinating light object with the aesthetics of artistic creation. The launch of the next Masterpiece, which is being developed in

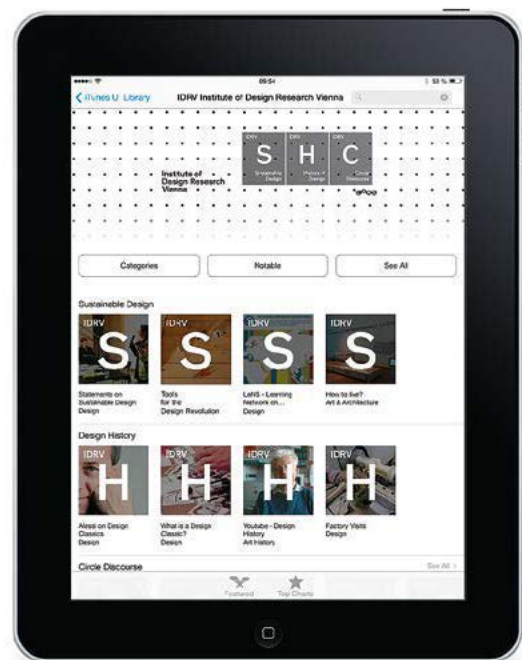
cooperation with Anish Kapoor, is eagerly awaited. The London-based artist already designed the 2011/2012 annual report for Zumtobel with the central theme of the power of colour and its effect on the viewer, especially as a process of very subtle change. The Masterpiece will again show that light and colour, perception and emotion are inseparably interconnected – an innovative and artistic interpretation of the immaterial substances light and colour.

[WWW.ZUMTOBEL.COM/MASTERPIECE](http://WWW.ZUMTOBEL.COM/MASTERPIECE)

### Learning On the Go Zumtobel supports iTunes U Course offered by IDR.V

Lecture series, language courses, discussions or interviews downloaded to a personal computer or mobile end device for learning at home or on the go – that is the idea behind iTunes U. Meanwhile, the courses are also offered in the curriculum of the Institute of Design Research Vienna (IDRV). Since 2011, a focus of the research activities is on sustainable design. Initial insight into the researched subjects, methods and procedures for socially and ecologically sustainable development was offered in the autumn of 2012 in the exhibit “Tools for the Design Revolution”. The iTunes U Course transforms it into an interactive concept of imparting knowledge. The format effectively reflects the context of individual contents and expands the exhibit concept into a comprehensible and freely available textbook. The course will also deal with the subject of light, with the support of Zumtobel, by examining issues of sustainable products and solutions, as well as user-oriented design.

[WWW.IDRV.ORG/ITUNES-U](http://WWW.IDRV.ORG/ITUNES-U)







### Morphing Light to Space Multimedia light installation "Cornea Ti" for Luminale

How impressive it can be to change the atmosphere of a city only by means of light is demonstrated by the "Luminale" light festival that takes place in Frankfurt every two years. On a container boat in the vicinity of the Holbeinsteg Bridge, students of interior design at the FH Mainz University of Applied Sciences, under the supervision of Prof. Klaus Teltenkötter, will present the interactive light installation "Cornea Ti" at this year's festival. Two open, modified containers will offer a multimedia experience. Layer for layer the shapes of letters will be transformed here to allow the visitor

to enter an intense atmospheric experience of space. The colourful installation will come to life through 1,600 video-capable Zumtobel CAPIX LED luminaires. Computer-controlled in real time, the animation will present a system that responds to spatial movement. For outside spectators, the containers will also function as a stage, where a one hour visual music performances are planned in the early evening hours. Luminale 2014 will be held simultaneously with the Light + Building trade fair from 30 March to 4 April.

[LUMINALE.FH-MAINZ.DE](http://LUMINALE.FH-MAINZ.DE)

### "Everything is Architecture" On the 80<sup>th</sup> birthday of Hans Hollein

Hans Hollein, born in 1934 in Vienna, is one of the few universal geniuses of his generation. He studied architecture in Vienna and the USA and created numerous works in the role of architect, urban planner, designer, sculptor, freelance artist and architecture theoretician. In the 1960s he was among the protagonists of the Viennese avant-garde who rebelled against the conventional art world and the prevailing functionalism of postwar architecture. In 1964 he founded his first own architecture studio in Vienna. With the design of the Retti candle shop he set a fundamental milestone in his architectural career, followed by many others, including the Museum Abteiberg in Mönchengladbach, the Museum for Modern Art in Frankfurt/Main and the highly controversial and now celebrated Haas-Haus across from Vienna's Stephansdom cathedral. Hollein is a winner of the Pritzker Prize and was the first non-Italian to organise the renowned Venice Architecture Biennale, in 1996. In the same year he designed the first light forum for Zumtobel in Vienna's inner city. Hollein will celebrate his 80<sup>th</sup> birthday on the opening date of Light + Building on March 30<sup>th</sup>. Our hearty congratulations.





[WWW.HOLLEIN.AT](http://WWW.HOLLEIN.AT)






PHOTO shutterstock.com/Radu Bercan

#lightlive




KNOWLEDGE   DESIGN   INNOVATION   PROJECTS




Launch of the biggest ever Zumtobel user study

#design 11/12/2013 Caroline Merlin




Stavanger Konserthus – Artwork for music

#projects 28/01/2014 Nikolaus Johannson (N.)




"Amazing Image Video" @lightnowblog.com

#knowledge #design 05/12/2013 Adam Burton (AB)



Vodafone Village @architonic.com

#projects 18/12/2013 Adam Burton (AB)



Astrup Fearnley @mondo arc

#innovation

AZUMTOBELPROJECT

28/10/2013 Nikolaus Johansson (NJ) 09/01/2014 Britta Maier (BM) 

## #lightlive

### Digital expansion of lightlife magazine

The Zumtobel online platform lightlive supplements the established lightlife magazine with a source of digital information. The international website: [www.lightlive.com](http://www.lightlive.com) is intended as a focal point for all company social media actions. The site collects and supports information about the application of light. It is divided into four general subject areas: knowledge, design, innovation and projects. At the same time, it is a collection of all relevant social media contributions from employees and protagonists of the industry. Users can read the latest blog entries, watch videos or post comments and therefore participate in a direct exchange with Zumtobel. They also receive information about activities on various social media channels: Twitter, LinkedIn, Vimeo, YouTube and Google+.

The supplementary app for tablet computers and smartphones enhances the experience of the digital media offered in connection with the lightlife magazine. The current digital issue includes even more supplementary pictures, interesting videos and additional information related to the individual articles.

Available for free download in the iTunes App Store and under Google Play, in German and English.



# Landscape Becomes Architecture

The Antinori winery in the hills of Chianti

PHOTOS Pietro Savorelli TEXT Katja Reich  
ARCHITECT ARCHEA ASSOCIATI, Firenze  
Arch. Marco Casamonti















For centuries the gently rolling hills of the vineyards and olive groves have characterised the fertile Chianti region. Everything here promises enjoyment – for the palate, for the eye, for the soul. To preserve the idyllic quality of this region created by the landscape was the top priority for the Florentine architects Archea. With two horizontal incisions in the hilly landscape they designed the new buildings for the winery of the Antinori family in perfect harmony with the captivating background scenery. For the most part, the large areas for wine production and storage disappear underground, making use of the natural air conditioning offered there. The office, wine tasting and sale areas open out into the landscape, giving visitors a view of the vineyards. The curved line of the roof construction follows the ranges of hills and a sculptural spiral staircase twists like an oversized corkscrew out of the ground up to the observation terrace on the roof. The clearly structured interior spaces form a deliberate contrast, although presented with the same elegance as the outdoor areas. Glazed atriums and effectively positioned skylights allow daylight to penetrate the interior of the building. Fine light lines set virtuosic accents. Only the cellars remain cool and dark, hidden underground. Unexposed to sunlight and temperature fluctuations, the delectable wines age here beneath the impressive vaulted ceiling constructions.









# The Strength of Simplicity

People are confronted with an abundance of information every day. Phil Libin knows how modern technology can help to create order from chaos.

ILLUSTRATION Blagovesta Bakardjieva,  
Martin Mörck INTERVIEW Goeff Poulton



## INTERVIEW



One of the most unoriginal ideas in technology? You won't find many Silicon Valley bosses talking about their own product in such modest terms. Evernote is already helping 80 million users around the world lead more organized and productive lives, but CEO Phil Libin is constantly striving for better solutions. After all, maximum benefits require perfect development work.



Phil Libin, founder and CEO of Evernote, a software and web application for organising information in different formats



**The CEO of Evernote must be a well organised person – are you?**

PHIL LIBIN No, I'm not. And that was actually a big part of the inspiration behind starting the company. There are certain people who are good at organising, even enjoy it. My wish was to be productive without necessarily being organised. Once we began to work on Evernote, we realised that we weren't the only ones with that desire.

**Do you think our modern lifestyle, in which we're surrounded by a sea of information, has made this more difficult?**

PHIL LIBIN Yes, I think so. It's become a more acute problem. We're overwhelmed with a flood of details coming at us all the time. While it can be stressful to handle, I ultimately believe this is a good thing. It's what we're good at and what makes us uniquely human – dealing with and processing information to improve our lives. It's a constant evolution that dates back thousands of years to when we first started inventing things.

**Where are we now in this process?**

PHIL LIBIN I believe that we're on the verge of a really gigantic change in how we lead our lives. The past 20 years or so have been defined by differences in hardware and software. This split between digital and more physical products, hardware and software, is something that we hadn't really encountered before, but I think it's just a temporary phase. This split is fading before our eyes – over the next five years, it will recede significantly, and, in ten years, it will be gone completely. We'll have a hard time remembering what we meant when we were talking about digital versus physical and hardware versus software, because they will have become the same thing. We will be surrounded by intelligent physical surfaces containing digital information. We're just starting to see the beginning of that, and I think it's going to be a very profound change.

**Won't this complicate things further?**

PHIL LIBIN Yes, there'll be more information and more opportunities to get lost in it, but that's why we have to build things to help us navigate and turn it to our advantage.

**How can technology help us do this?**

PHIL LIBIN For most of human history, the thing that was in scarcest supply was factual knowledge. Since the advent of the Internet, and then inventions such as Google and Wikipedia, this has changed. The issue became not that you didn't have access to the information, just that you didn't have it to hand; something that has changed with the introduction of mobile devices. Now, there are so many choices, so many things to find, that searching itself is too time-consuming. Technology has to figure out what you want before you know that you want it. It has to give you the information you need to make a decision before you think that you need to search for that information. It must anticipate what you want to do. This is what we're slowly starting to see develop.

**How hard is that to do technologically?**

PHIL LIBIN Of course it's hard, but I don't actually think that it's primarily a technological difficulty – I think it's more of a design difficulty. We call it augmented intelligence – it's a design problem first and an algorithmic problem later. The user experience has to be right and I've learned that it's very important to make something simple. Usually, there's a trade-off between making something more powerful and making something more simple. Whenever you have that trade-off, that's bad design. Design becomes perfect when there is no compromise between the two.

**Does that apply to software and hardware?**

PHIL LIBIN Absolutely. Apple products are so successful because they have certain designers involved in creating both the software and the hardware. There's a harmony between the two.



We recently started a partnership with 3M, which makes the Post-it notes, and it has really broadened our horizons. This is the very definition of simple design, but there's also great attention to detail, from the size to the colours and the stickiness. Digital design can certainly still learn from the physical design world. And, ultimately, design is about much more than what your products look like. It's holistic — it's reflected throughout the company, from the office space, through to the company culture. That's why we have involved our designers in everything; it reflects what a company stands for.

**By becoming increasingly reliant on technology, isn't there a danger that our own brain power will suffer?**

PHIL LIBIN There's always that danger, but there's also great opportunity. This concern has been around forever and in some sense it's true. When we invented writing, our verbal memory did get worse, but I don't think people would say that writing was bad for civilization. It just means that our brains develop in different ways. Hopefully the things that our brains improve at are the crea-

timate this, but I think it will become clearer over the next five years. So, rather than talking about 'need', it's better to look at the experiences that make you happy. If a new version of something provides a better experience than the old version, then you need the new version.

**What does this technological development mean for our work-life balance?**

PHIL LIBIN To be honest, I've given up on work-life balance! At best, it's maybe work-life integration. I'm always thinking about everything and this is the core of the modern knowledge worker. Yes, you could be checking your emails at 11pm on a Saturday, but the flip side is also true: if you're in the office at 2pm on a Wednesday afternoon and a friend sends you a review for a new restaurant, then you're not going to wait until you're home to look at it. This is the lifestyle of the modern knowledge worker. For people who are fortunate enough to have a job they enjoy, this lack of artificial distinction between the two is a good thing. And I think the number of people who appreciate this flexibility is grow-

## We have to design tools that we can use to navigate within the flood of information.

tive things, not just being able to store information. As (productivity consultant and author) David Allen says, the brain is for having ideas, not for holding them.

**Do you think that digital technology will ever replace the pen and paper?**

PHIL LIBIN No, absolutely not. And my opinion has really changed on this. When we started Evernote, I thought that paper was the enemy and everything should be digital. But then I realised that this was dishonest. If you go to a meeting at Evernote, half the people are taking notes with a pen and paper, including myself. The truth is, it can still be a great experience, and we should embrace it and try to improve it. We're now trying to give a digital life to traditional physical products, to merge the two. Writing on paper won't go away, but bad, inefficient experiences with paper will diminish.

**Do we need so many different ways of recording and sorting information?**

PHIL LIBIN I don't think 'need' is the right word. It's important to consider the bigger picture here: the world is moving very quickly towards a knowledge-based economy. This means economic output is much more dependent on these knowledge workers. Their output is based entirely on their state of mind, so happiness matters directly — much more than it ever did. Happiness drives economic output in many countries. People still underes-

ing. My work is important to me, but so are many other things. I try to be better at managing all of these things by treating them together.

**What's the key to living a better organised and more productive life?**

PHIL LIBIN For me, it's the sense of purpose. It's not about a tool or technology, it's about working out what you're trying to optimise for. Whether it's to spend more time with your family or make more money, this is the most important thing you can do, but few people actually stop to figure it out.

# Heroes of Space

They are the people who give spaces a voice and make abstract content tangible for the viewer: the scenographers.

TEXT Tim Gutke



The walls are white, as are the floor and ceiling. It is quiet. The space is empty. The space is. Or isn't it? That is the philosophical question of being, appearance and meaning. Do we exist only when we communicate? When a tree falls in the forest, does it make it sound if no one is there to hear it? A space becomes expressive only through the people who design it. Only then does it challenge us to join in an intimate dialogue, radiate warmth and give us a vision.

Over the past decades the art of visionary dialogue composition has developed into a profession: scenography. Scenographers are interdisciplinary specialists who work in theatre, film and at exhibits. They are the next generation of set designers, creatures of spatial design. Better: they are the producers of

space. This space can be either real or virtual and its tools are performance and installation. As in all stories about autonomous scenes, here we also find heroes, mechanisms and the various approaches to artisanship. The fundamental task of a scenographer, however, can be summed up in one sentence: he spatialises contents. Sounds abstract? Somewhat, although the work of the scenographer is more tangible than the above description suggests. Scenography is everywhere. It penetrates us, it lives with and through us.

29 April 2013, a historic football event casts its shadow on the future: the festive laying of the foundation stone for the DFB German Football Museum in Dortmund. One of the speakers is Germany's Minister of Sports, Ute Schäfer. Proudly she announces:





The perfect illusion. Audi exhibit at IAA 2013.

"The laying of the foundation is the 'starting whistle' for the construction of this unique building." However, the contents of this building will also be rather unique. The 'football shrine', as the architect calls it, should reflect the emotions and experiences associated with football as a sport. It is the hour of the scenographers, the hour of Prof. Lutz Engelke, Managing Director of Triad. "The signs of football have created an international comet trail that is left behind in the collective memory. This trail has to be tracked down and made visible and accessible. In this spirit, the House of Football is a place that points beyond itself and transmits and receives like a medium. It is therefore in its most modern form of expression a multimedia interface that seeks direct contact with the visitor."

Engelke describes how he imagines this contact to take place as follows: "It is a walk-in social history in a classical sense. Objects, graphics, sounds, videos in space, main show and media transformation spaces play with the magic of football. Therefore, the extended museum concept, as it is developing in the 21<sup>st</sup> century, will become a standard for us in this House of Football." It is hard to imagine, offering a football fan a promenade of two-dimensional image worlds. It is only one example of how deeply scenography is embedded in social communication.

Although the term is still relatively new in modern usage, the need for spatial production has existed ever since man started arranging objects in a particular manner. Important resources for scenographers to the present day are the cabinets of art and





The producer of space: Man becomes part of the production in the GS Caltex pavilion of the Atelier Brückner at Expo Korea (top). Tristan Kobler guides the visitors through Dresden's Zwinger as if it were a stage play (bottom).



wonder from the 17<sup>th</sup> century. Scenography was therefore already an integral part of the early phase of museum history, long before this Anglicism came into use. And scenography still plays a major role in the continuing development of museums.

The use of new, primarily interactive media and the integration of performance elements and dramaturgic narrative methods over the years, create diversity in the classical exhibit rooms. This new exchange of design media increasingly blurs the previous rigid boundaries of the professions of architecture, interior design, theatre, film, science and art. It is exactly in this area of conflict where the heroes of space are extremely successful.

It is also no wonder that Prof. Uwe R. Brückner, Creative Director of the Atelier Brückner, clearly formulates his point of view: "Our work strives for a holistic design philosophy. Our integrative and interdisciplinary approach to design, encompasses architecture, exhibitions, single exhibits, contents, light and sound, film and media." Prof. Uwe R. Brückner goes into raptures about 'immersive environments' in which the information does not force itself on the viewer, but is readily accessible on demand. The viewer is a very important part of this process. His is not the silent, passive role; rather he is involved and even directly addressed as part of the production. This new type of participation can open a window to unknown worlds in which he becomes an active participant.



The architect Anna Klingmann even goes one step further. "Ideally, there is no viewer in scenography. Instead, the viewer becomes an actor in a three-dimensional environment, which he or she helps to design," she explains. Since her enterprise, Klingmann Architecture + Brandsapes, plans building complexes, as well as, interiors throughout the entire world, the concept of visitor participation and perception in diverse cultures is an important aspect for her: "In every one of our projects we strive to create a unique identity that relates to the particular location and culture. The story that is told in this process is therefore completely different from culture to culture, from country to country and region to region." For the Khawr Awqad project in Oman she planned a spacious area that was adapted to the local circumstances and includes an ecological resort, a village-like residential district and a large park.

Communication across cultures is the goal of Tristan Kobler, who in his architecture – like a director – guides the visitors through the locale as through a stage play. "Scenography is a playful encounter with the viewer, attempting to entice and guide him in a particular direction, to create an atmosphere, a feeling or to embody an attitude." The renovation of the Mathematical-Physical Salon in the Dresden State Art Collection implemented by Holzer Kobler Architekturen provides an opportunity to marvel at this approach.

For Tristan Kobler it is crucial to formulate a clear intention at the very beginning of the planning stage. What is the message, what should remain with the visitor? These questions he asks in coordination with curators, building owners and clients – in a focused dialogue. One of the major challenges of scenography is to find a common language without stopping at the lowest common

denominator. His motto: "One has to be able to walk through the exhibit in three minutes without missing anything essential."

A similar approach is followed by Susanne Schmidhuber, who tells "Stories in Space" with her brand scenographies, however "without words". At IAA 2013 the design team succeeded in turning the Audi exhibit stand upside down. This amazing 3D scene caused visitors to stop in astonishment. The "hanging city" opened up an unusual change in perspective, jolting the visitors from their visual routine. For Schmidhuber, addressing the emotions of the viewers is a necessary part of the design process. To enhance these worlds of emotions and information the Schmidhuber studio seeks the confrontation with technical innovations and sees augmented reality "as a new key to the interactive experience of space."

Scenography therefore lives from its protagonists and their inherent power of discourse. The "Scenography Biennale" was established in November 2013 in Stuttgart as a platform devoted to the discussion of different design approaches and a network for the higher education community. The tree that falls without being heard was not among the topics under discussion – scenography is apparently well beyond the search for meaning. It has arrived.

German Football Museum in  
Dortmund – the scenographers  
pull out all the stops of  
multimedia presentation.



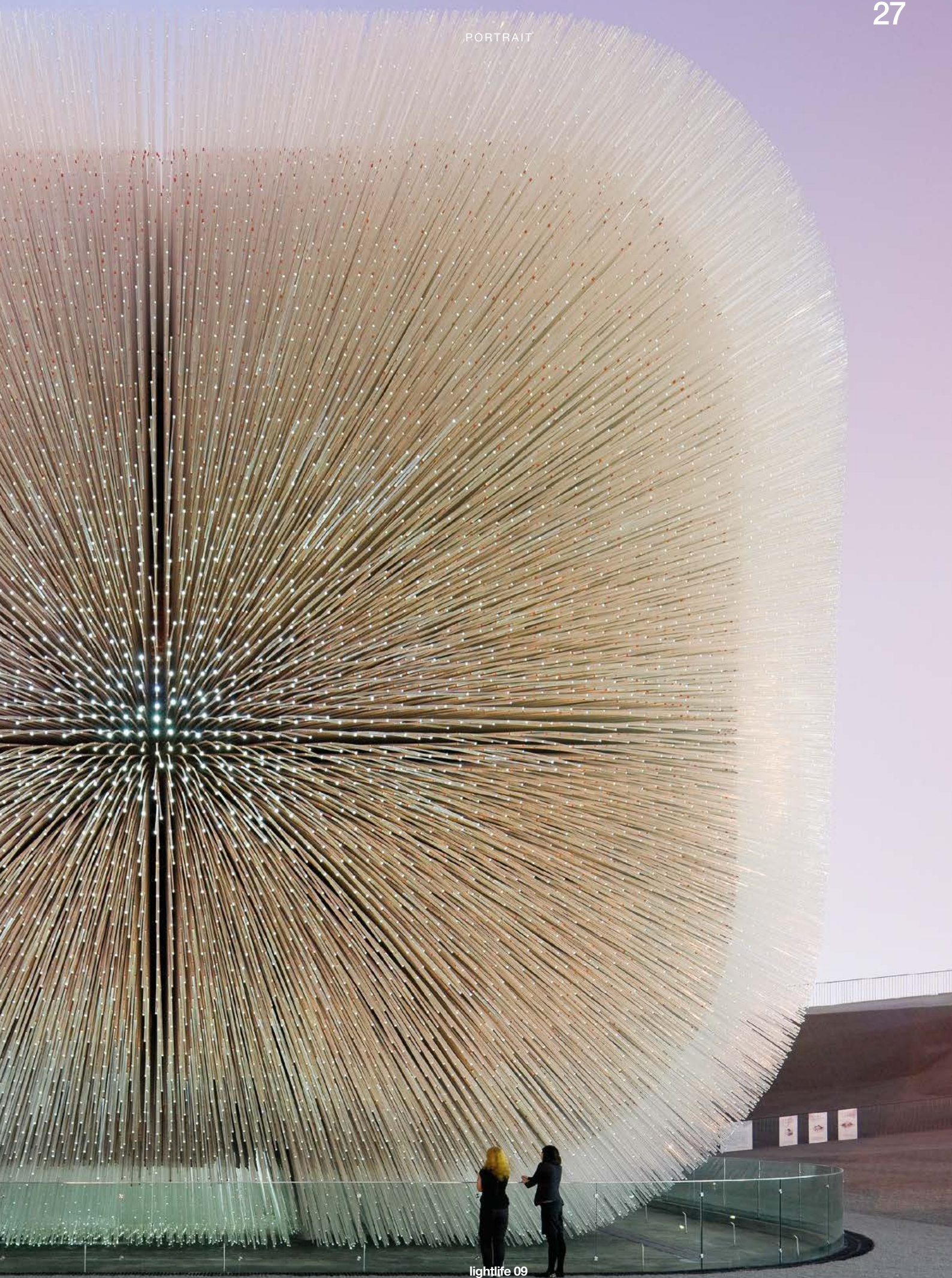


# Boundless

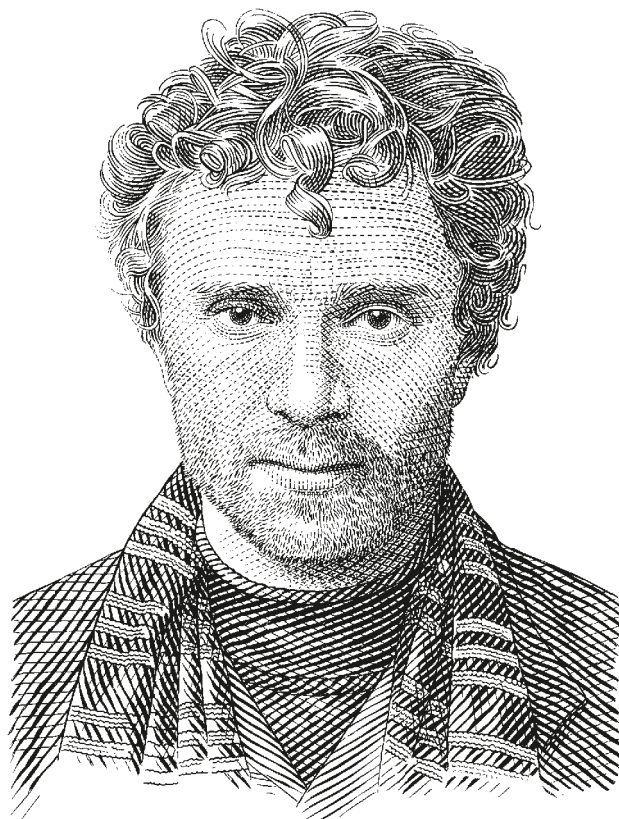
In the London studio the sought-after designer Thomas Heatherwick transforms his knowledge and experiences into art, design and architecture.

PHOTOS Heatherwick studio ILLUSTRATION Martin Mörck TEXT Eva Steidl









Thomas Heatherwick,  
founder of the Heatherwick  
Studio in London

He is the youngest designer to receive the title “Royal Designer”. In 2010 the British marvelled at his poetic national pavilion at the World Exhibition in Shanghai, and in 2012 the world watched as Thomas Heatherwick kindled the Olympic flame with narrative intensity. Why it is not presumptuous to call Heatherwick “Leonardo da Vinci of the modern age” becomes clear to anyone allowed to visit his London studio.

Thomas Heatherwick’s studio is like a beehive: Upon entering the rooms, which are directly across from the international St. Pancras railway station, one of London’s most important traffic nodes, one immediately senses the heightened activity and focused energy that prevail here. Some of the employees roll a huge stack of sample material through the front door, the glass dome of an architectural model is being polished meticulously, while among medium-high shelves, which serve as the only partitions in the open plan office, several groups of creative individuals are deep in discussion. Every single person here seems to know what needs to be done. This structured business has an inspiring effect, like a choreography that can also be gathered from Heatherwick’s work.

He became famous as a result of a rotating circular armchair, a rolling bridge and his hairy Expo pavilion. Yet Thomas Heatherwick has actually always been a designer. Not with the goal of becoming a designer, but rather at first out of childlike curiosity and enthusiasm for things, machines, tools and buildings. He recollects his first designs – when he was 10 years old. His huge accumulation of old inner tubes, television sets and junk electrical appliances, which transformed his room into a workshop. And the fact that his father gave him books about Victorian architects, which awakened his interest in the immense inventive spirit of those universal scholars. His biggest patron, Sir Terence Conran, says Heatherwick himself is one today, an exceptional talent. But

such panegyrics do not especially interest him. In general, he evades any discussion about what he is: designer or architect? Artist or tinkerer? Thomas Heatherwick is a man of action. He wants to design, whether large or small, building or object.

A much discussed project at the moment is a footbridge that is to connect the north bank of the Thames with the south bank: a huge green strip with a length of almost 400 metres, whose vegetation should let the city dwellers forget they are in the midst of a metropolis. The model of the bridge impressively spans a length of several metres through the studio, making clear even in this dimension the painstaking work that goes into such a project. In his workshop alone, which occupies one-third of the studio rooms and is the core of the studio, Thomas Heatherwick employs 12 people who are involved with model building – because the prototype is his most important tool for assuming different perspectives. Because he has to be able to take an idea in his hands, to grasp, shape, understand and revise it. Especially with respect to a building concept in which the human relation can all too easily be obscured by the scale of the project.

Heatherwick prefers to hold presentations and meetings in his studio, where ideas are formed into objects, where models and materials and especially the employees are present with whom he works on large-scale projects such as the “Garden Bridge”. His customers like to immerse themselves in his busy microcosm – behind a mobile glass wall that can be used to partition off a meeting area in the twinkling of an eye, technical experts and structural engineers crowd around a monitor. Because the bridge project is in a crucial phase: while the critics and members of the jury have given the go-ahead, it is now necessary to tackle the specific issues of implementation and, above all, to convince the public. Four of the total of 150 million that the building will cost were provided in advance by the operating company “Transport



for London"; for the rest, financial backers still have to be found. If everything proceeds on schedule, the bridge should be finished in 2017. A very ambitious goal, but Heatherwick is optimistic.

His biggest talent is perhaps that he fears no dimension. On the contrary, the bigger the project, the clearer is his necessity to think through every detail and to create something, which is due to his interest in small things. He calls that "rastering" and "zooming", which means that he and his team can switch the perspective between the master plan and detailed solution at any time and in any stage of a project. He would never throw a hasty sketch to his staff for implementation; usually he can be found where the work is being done.

Heatherwick's projects involve the work of engineers, architects, product and landscape designers, project managers, sculptors, set designers and artisans – currently there are 140 in total. If one attempts to describe this interplay as multidisciplinary design, the product design graduate shakes his head vigorously. He is only concerned with three-dimensional design, which is why he does not call his projects buildings, furniture or products – but rather ideas. Above all else, their design has to be one thing: human.

A project that fuelled the hype about his person in recent years is the Routemaster bus. Heatherwick was awarded the contract to re-invent the classic bus. An immense challenge, which he approached with a single question: Can the London bus be better designed today while using 40% less petrol? Not that the answer would be easy to find, yet in 2012 the first Heatherwick buses with hybrid propulsion went into operation. They depart directly before the door to the studio, one of their destinations being the Eastern District of the city, where Heatherwick convinced the public during the Olympic Summer Games that he can design not only objects, but also moments of profound expressive power. Always motivated by the question of how to use materials and shapes in human dimensions even for large-scale projects,

he created a setting for the Olympic flame that consisted of 204 single copper petals that were lit by athletes from all of the participating countries. The petals were crafted in Heatherwick's model-building workshop, first from paper in the real size; later the team applied traditional methods of craftsmanship such as those used to shape copper in automotive restoration.

Thomas Heatherwick calls his workshop a secret weapon, which he can rely on even when everything else fails. Often he develops new tools here, because what he considers a means to an end either simply does not yet exist, or only on a different scale. The child's box of modelling clay is the best example: it is a recurring initial idea in Heatherwick's work. By simply pressing coloured modelling clay through a perforated plate, children create colourful hairdos; Thomas Heatherwick transfers the extruding process to benches and entire building façades. And because such finds are especially important to him, he puts the handicraft set next to all the other objects he collects on countless shelves in his studio: models, prototypes, patterns, components, material samples and tools. There is even room for a wooden box and the portfolio of an employee. In Heatherwick's concept of order nothing is too trivial and nothing is too significant. His talent of designing in all dimensions at the border of the possible will continue to impress us in the future – Heatherwick's designs are now more in demand than ever. In any case, his projects are convincing evidence of his infectious adventurousness of action and the snapshots of his studio provide vivid insight into one of the most fascinating creative labs in today's world.

Objects, architectures or events –  
Heatherwick turns visions  
into reality.





# Learning from Outer Space

In the new “:envihab” research facility the DLR Institute for Aviation and Space Medicine tests the results of weightlessness and the physiological effects of light on humans. Both are interesting not only for space travel.



PHOTOS Christian Gahl TEXT Armin Scharf







The wraparound glass strip between the floor and ceiling and the six skylights allow ample daylight to enter the building.



The Cologne Airport borders directly on the endless expanses of space – although there are no launching pads to be found here, since the travels into the orbit and beyond take place on the ground. Here at the Institute for Aviation and Space Medicine of the DLR National Aeronautics and Space Research Centre, simulations are conducted to test the effects of extended stays on board a spacecraft. Weightlessness is a special focus of the researchers, due to the complex physiological changes it can cause – such as muscle or bone degeneration.

A new research environment is now available for such studies: the “:envi hab”, protected and supplied by an elongated, floating structure with a white, perforated façade directly across from the old institute building on the DLR grounds. The name “:envi hab” is a contraction of “environment” and “habitat” and the facility is used for tests such as the “bed rest study” that can last up to three months and places only one requirement on the test subjects: they have to stay in bed. This requirement is so stringent that the subjects are moved to a special bed when it is time for them to have a shower. And the surface is inclined six degrees so that their heads are lower than their legs at all times – this position is especially favourable for simulating weightlessness, according to the researchers.





Behind the black cylindrical concrete wall there is a short-arm centrifuge at work. Can increased gravity help counter the health risks of weightlessness?

For these “bed rest studies” alone the “:enviLab” has twelve rooms, in addition to the afore-mentioned shower rooms, special carts, a completely furnished kitchen and a common room. Although not necessary for lying in bed for extended periods, it is needed for isolation studies on a group scale, simulating long journeys through space.

The “:enviLab” sleep and physio-lab also deals with terrestrial matters. It is used, for example, to examine the effects of shift work, lack of sleep or irregular working hours – and the effect of light. The circadian rhythm of daylight defines human waking and sleeping phases – receptors in the retina register the change of short-wave light and control sleepiness by means of melatonin production. In the sleep labs this rhythm can be systematically delayed or even interrupted – in order to observe the effects on well-being, health and performance. The diffuse and variable light needed for these tests is provided by the luminous ceilings equipped with LEDs in the rooms, and also where the test subjects are examined by means of PTE (positron emission tomography) scans.

In cooperation with the DLR Institute Zumtobel developed the modular luminous ceiling, whose CIELOS LED elements can

generate precise and dynamic luminous colours and luminances by means of the LITENET control system. The brightness can be dimmed continuously down to a minimum level without flickering and the RGB spectrum can also be varied as needed. The low installation height, durability and user-friendly maintenance were further arguments for an LED luminous ceiling.

The purpose of these circadian studies is not only to examine the interaction of light and the condition or performance of the test subjects, but also to clearly define the qualities of light necessary to prevent fatigue at the workplace or to reduce the effects of jet lag.

Of course, the “:enviLab” does not consist only of the sleep and physio-lab; the complex comprises a total of eight research modules under one roof. The architecture is literally based on the house-in-house principle. All of the modules and the large auditorium are designed as separate structures beneath the roof construction, which defines the outward effect of the building and is actually more than just a roof. The steel support structure contains the building’s entire technical infrastructure. This was somewhat of a trick, since the 3,500 square metre interior – rather uncharacteristic for a research facility – presents itself as orderly and clearly structured.

In the sleep and physio-lab the LED luminous ceiling can be dimmed continuously and the entire RGB spectrum can be varied as needed. Supported by modern LED technology, the studies conducted here provide important information on the effects of the circadian rhythm on well-being, health and performance.

The “:envihab” is also a symbol for a new self-conception in research – in the past, such facilities tended to be purely functional in nature; today, the publicity effect is increasing in importance. In addition to the exterior, this paradigm shift is apparent especially in the interior. The entrance on the ground level is connected by a wide and pleasantly designed stairway to the spacious entry hall. The large auditorium with seating for 150 and the restaurant infrastructure are designed as a location for external events. Although situated below the ground level, the entire interior is surprisingly illuminated by daylight – this is achieved not only by the wraparound glass strip between the floor and ceiling, but especially by a total of six light wells that penetrate the building vertically at different locations, establishing a connection with the sky – in keeping with the central theme of the DRL, which the architects adroitly interpreted.

The incompatibility of public utilisation with sensitive fundamental research necessitated a separation of the two areas by means of a partition. But since they are made of glass, the room volume can be experienced in its entirety together with the individual modules. In the centre, for example, there is a cylindrical module with solid concrete walls, with a short-arm centrifuge inside. This apparatus is used to explore whether increased gravity can be used selectively to counter the health risks of weightlessness. Initially in relation to long-term stays in space, the results will also bring new insight into down-to-earth issues such as osteoporosis, muscle degeneration and circulatory disorders.

BUILDING OWNER National Aeronautics and Space Research Centre, Cologne/D  
 ARCHITECTURE Grass Kramer Löbbert and Prof. Uta Graff Architekten, Berlin/D  
 LICHTKONZEPT Schlotfeldt Licht, Berlin/D  
 LIGHT- AND ELECTRICAL PLANNING Carpus + Partner AG, Hattersheim/D  
 ELECTRIC INSTALLATION R+S Solutions GmbH, Radebeul/D

LIGHT SOLUTION CIELOS LED modules, LITENET lighting control system



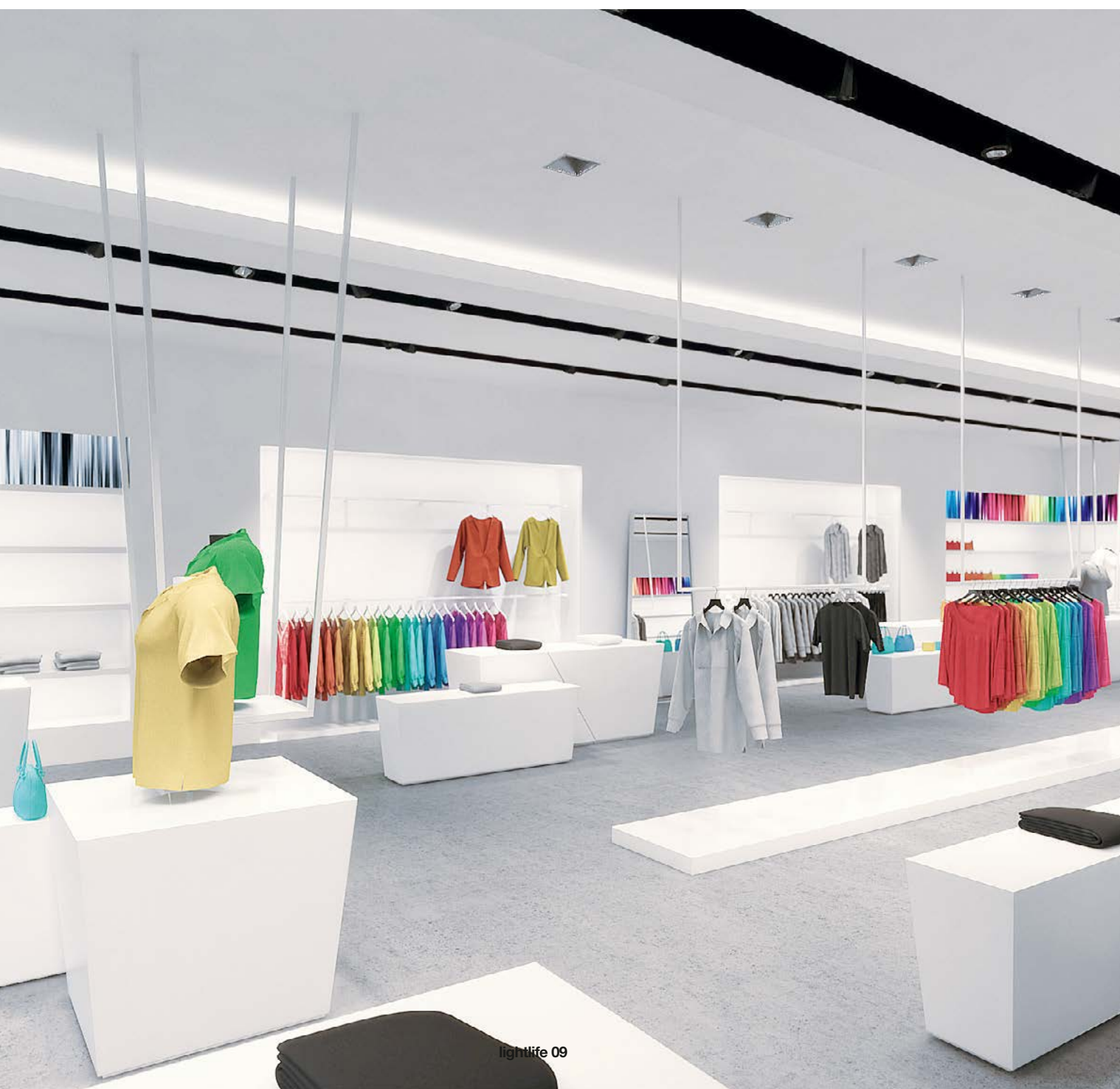




# Light as a Factor for Success

A lab study conducted jointly by Zumtobel and the Gruppe Nymphenburg makes it possible for the first time to measure emotional responses of people to different light scenarios at the point of sale (POS).

PHOTOS Zumtobel TEXT Roland Pawlitschko



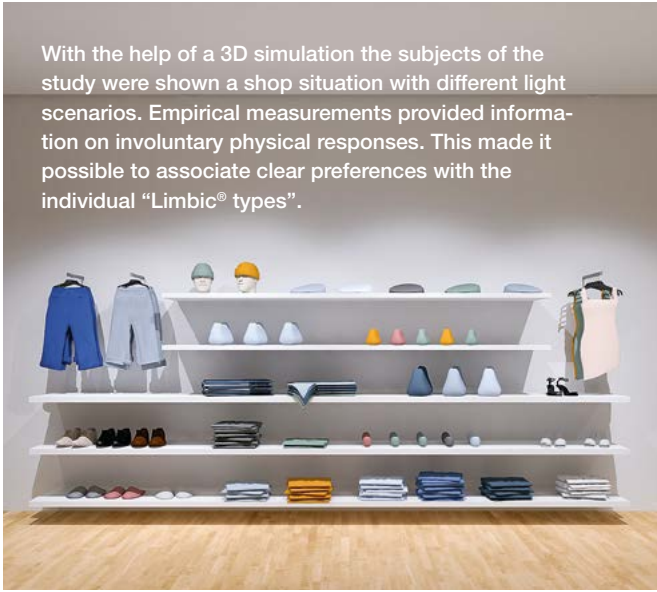


The latest research in the field of neurosciences shows that about 90 % of decisions to buy are influenced by emotional factors and unconscious responses.



Despite online shopping and express deliveries, real sales outlets will not lose importance in the future. For customers, shopping is by no means only an opportunity to purchase products. Rather, they seek human contact and, moreover, they want to experience the products, including all of their functions and manifestations. The latest research in the field of neurosciences shows that both this experience of shopping and decisions to buy are affected especially by emotional factors and also by unconscious decisions, to a degree of approximately 90 percent. The optimal lighting for the POS is of crucial importance in this connection. On the one hand, light is necessary to make products visually perceivable and only with the right light scenarios is it possible to create spaces that touch the senses, where people feel comfortable also for extended periods of time.

With the help of a 3D simulation the subjects of the study were shown a shop situation with different light scenarios. Empirical measurements provided information on involuntary physical responses. This made it possible to associate clear preferences with the individual "Limbic® types".



To evaluate the effect and the quality of light at the Point of Sale (POS) in the past, customers were questioned using widely varying survey methods about their subjective impressions – with no consideration of unconscious feelings. Researchers at Zumtobel went one step further together with the Gruppe Nymphenburg, the worldwide leading consulting and market research firm for brand positioning with its head office in Munich. In a lab study conducted in 2013 with 48 subjects, they developed an experimental setup that made it possible for the first time to empirically measure the emotional effect of light. The study was based on the knowledge that socio-demographical descriptions such as age, income or gender are by no means sufficient for categorising people in target groups. Instead, it proves much more practical to categorise people based on a characterisation developed by the Gruppe Nymphenburg in seven different "Limbic® types", or personality types: open-minded, hedonist, adventurer, performer, disciplinarian, traditionalist and harmoniser. The goal of this research project was to gain basic insight about whether and how

these seven groups respond emotionally to widely varying light scenarios at the POS.

The experimental setup consisted of a panorama wall showing the stationary 3D simulation of a fashion shop, where articles of clothing were presented on stands, shelves and sideboards. The test subjects, males and females between the age of 19 and 62 of all "Limbic® types", sat quietly on a chair and observed a sequence of 20 light scenarios with different general and accent lighting, colour temperatures, contrasts and quantities of light. An important aspect of the study was the simultaneous empirical measurement of numerous body functions not within the active influence of the test subjects. From the psycho-physiological values measured in this "Limbic® Emotional Assessment" it was possible to categorise the seven "Limbic® types" in three groups with similar response behaviour. Also, it was clearly established which parameters of the lighting scenarios evoked positive or negative emotions, activation or relaxation among certain target groups.

Although it was often hardly possible for the test subjects to detect changes with the naked eye, the results of the measurements confirmed that people of all "Limbic® types" showed individual emotional responses even to minor changes between the single light scenarios. Some target groups, for example, preferred functional, balanced illumination with broad distribution of warm white light, while others favoured very close, dramatic light distribution with cold white light. In the end the lab study also clearly showed, however, that there is no light scenario to which all types responds in the same way. Nevertheless, some lighting profiles were identified to which several "Limbic® types" responded positively for the most part. These findings open up entirely new possibilities for offering the retail sector target group-specific lighting to keep customers in the store longer.





# Light and Emotions in the Shop

Interview with Dr. Hans-Georg Häusel  
of the Gruppe Nymphenburg

PHOTO Andrzej Siegmund INTERVIEW Roland Pawlitschko

**Dr. Häusel, could you describe briefly how the development of the “Limbic® method” came about and its importance in modern research?**

DR. HANS-GEORG HÄUSEL In the early stages of my neuroscientific research activities I discovered that there were many theories in psychology and brain research that dealt with the unconscious and the emotions in an interesting way, but there was hardly any connection between them. In contrast to this situation I attempted to develop a holistic model that not only combines all of this knowledge, but can also be used in practice. The result was the “Limbic® method”, which is meanwhile considered by specialists to be one of the best methods for describing emotion and motivation systems.

**In what areas is this method used by the Gruppe Nymphenburg?**

DR. HANS-GEORG HÄUSEL The special thing about the “Limbic® method” is that it is easy to understand and apply, yet it is based on a solid scientific foundation. As human emotions are constant, there is hardly any area where this method cannot be used. Today we provide consulting services for big brands and banks, as well as automotive corporations – for example, to position brands or create special customer experiences.

**What is the role of light at the POS in comparison with other factors such as interior design, product displays or the appearance of the packaging?**

DR. HANS-GEORG HÄUSEL We observe again and again that the importance of light for the POS is dramatically underestimated and is neglected in favour of lavish packaging or shop renovations. In fact, the products require staging with light to give them their emotional significance. But the emotional signals emitted by the shop itself are also affected significantly by light. Nevertheless, no one ever had the idea to consider this aspect from

the point of view of neuroscience, i.e. from an entirely different perspective.

**What makes the lab study conducted in cooperation with Zumtobel different from everything else that has been examined in this research field up until now?**

DR. HANS-GEORG HÄUSEL While most researchers take a target group-oriented approach for the creation of moods or the presentation of products, we were the first to use neuromarketing methods to examine more closely the emotional influences. Traditional survey methods are insufficient in this field, because light has very powerful subconscious effects on people. When asked directly, people usually cannot say much about light – considerably less than in the case of acoustics, for example, where the consciousness is generally much more active. Yet light plays a very crucial role in shaping our moods. The acquisition of empirically measurable and also reliable data therefore requires examination of the unconscious, where the emotional responses originate.

**Why are lab studies in particular so well-suited for neuroscientific examinations of consumer retail behaviour?**

DR. HANS-GEORG HÄUSEL The major advantage of lab studies in the acquisition of objective data is principally the fact that every stimulus and therefore the cause and effect can be precisely controlled and compared. To do that in a field study, for example in an actual shop, would be possible only under very difficult conditions, since the test subjects are flooded by many different stimuli at the same time. In the analysis of the results it is then often not so easy to determine the actual cause of the measured effects – from the tested stimulus or perhaps from interfering influences.

# Little Car – Big Performance

Flagship Store BMW MINI in Frankfurt

PHOTOS Hartmut Nägele TEXT Roland Pawlitschko







Dimmable recessed ceiling luminaires allow presentation of the new cars like stars on the stage.

The design of the BMW MINI flagship store for new and used cars in Frankfurt is based on a remarkably simple architectural concept that appeals strongly to the senses. New and used cars are presented on an area of more than 2,500 square meters, clearly separated from each other by a middle axis that runs through the entire depth of the building and accommodates both the entrance and an event area with a stage, as well as a shop.

Despite the unified spatial effect, black floor covering, black round support columns and grey/black ceiling design, it is immediately clear which side is for the brand new cars and which is for the recent used models – not so much by how shiny the cars are as by the presentation and the lighting. The “MINI Next” area, as the used cars are affectionately called, gives the impression of an elegant parking garage with the cars parked in rows, while the more informal presentation of the new cars on the other side creates an inviting promenade for the visitors. In accordance with this arrangement, the used cars are illuminated with highly homogeneous light from dimmable SLOTLIGHT luminaires with a natural anodised aluminium casing installed in the ceiling. On the other

side of the middle axis, swivelling, likewise dimmable CARDAN LED recessed ceiling luminaires provide both the general lighting and the specific illumination of the new cars, which are highlighted as works of art by the sudden drop in ambient brightness. A carefully planned luminaire grid makes it possible to create this effect at any position in the new car area. A DALI controller provides for additional flexibility and presentation options, with the ability to generate a wide variety of light moods for different events, depending on the time of day or year. During the main hours of operation the interior, designed so to speak as a prime example for future showrooms, presents itself as a discretely elegant background, before which the cars alone are the stars.

BUILDING OWNER BMW MINI, Frankfurt/D  
ARCHITECTURE geiseler gergull architekten. GmbH, Frankfurt/D  
LIGHT PLANNING JK Lighting Design, Büttelborn/D  
ELECTRIC INSTALLATION Ziesler Elektrotechnik GmbH, Obernburg/D

LIGHT SOLUTION SLOTLIGHT light line, CARDAN LED spotlight, IYON



# Nature as Inspiration

L'Occitane en Provence in the Carrousel du Louvre in Paris

PHOTOS Hartmut Nägele TEXT Roland Pawlitschko







The decision for the light design resulted from the high colour rendering and the energy efficiency. The lighting contributes to L'Occitane's commitment to nature and the environment.

To capture the Provence lifestyle and nature with all its aromas and colours in an authentic manner was one of the essential goals from the very beginnings of the cosmetic manufacturer L'Occitane en Provence. This is reflected for example in the perfumes and cosmetic articles packaged in simple jars and tubes, and also in the boutiques operated in more than 100 countries, inviting shoppers on a "journey into nature and the region of southern France".

At the new boutique in the Carrousel du Louvre in Paris this journey begins in the underground shopping mall planned by Ieoh Ming Pei, which became famous through an upside down glass pyramid. In contrast to the rather cool elegance of the passage, customers are awaited behind the large display window by a kind of provincial market with traditional wooden furniture, dark parquet floors, small ceramic tiles and woven shopping baskets. Another characteristic feature is the ubiquitous use of ochre hues – reminiscent of the cliffs of the Luberon mountains and the special light of the Provence – as well as a translucent backlit glass roof, creating the impression of warm sunlight falling into the interior.

Both to support the extremely cultivated atmosphere and in the interest of a flexible light solution that is suitable for pleasant general lighting and specific accent lighting, the clients and planners chose a total of 70 IYON LED spotlights with a uniform warm white colour temperature (3,000 K). Mounted on tracks, the spotlights are positioned in the display window, as well as below and on the gallery – some as spots and some as "wideflood" versions with wide beam optics. The decision for this light solution, which includes 16 PANOS INFINITY LED surface-mounted luminaires for illumination of the checkout area, resulted from the high colour rendering (Ra 90) and the high energy efficiency, which not only saves money, but also reflects the commitment to nature and the environment at L'Occitane.

BUILDING OWNER L'Occitane, Paris/F  
ARCHITECTURE L'Occitane Retail Architect Team, Paris/F  
LIGHT CONCEPT Malherbe Design / L'Occitane, Paris/F

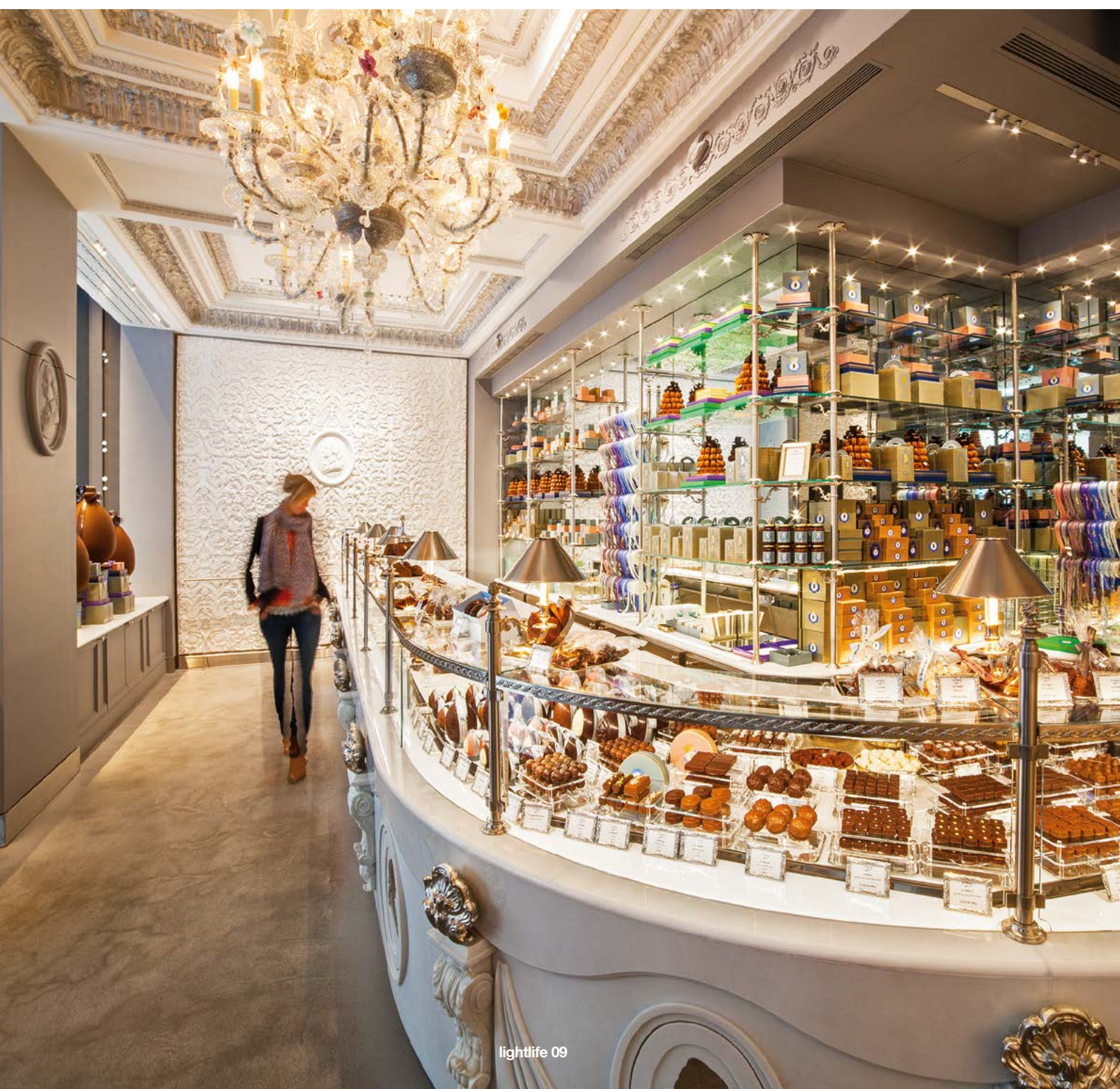
LIGHT SOLUTION IYON LED spotlight, PANOS INFINITY LED downlights



# A Feast for the Senses

Maison Ladurée in Paris

PHOTOS Damien Guicheteau TEXT Roland Pawlitschko







Controllable LED spots allow presentation of the sweet delicacies in brilliant light with minimal heat build-up.

Ladurée is world famous for its macaroons, which are always presented in an attractive environment and a pleasant atmosphere. “Les Marquis”, the new Maison Ladurée store in the vicinity of Place Vendôme in Paris, is committed to this tradition with a painstaking presentation of the assorted dainties. Stucco ceilings, wall reliefs and Murano crystal chandeliers combine with the modern materials used for the interior design to create a special elegance. The overall impression is perfected by the ultra-modern LED lighting to offer visitors an unforgettable experience.

Before this background, the Voyons Voir agency commissioned with the light design faced a double requirement: to present the spaces and materials so that their interplay results in an atmosphere both classical and contemporary. To develop precise yet unobtrusive accent lighting that presents the products of the pâtisserie with no negative impact from heat, for example.

In view of these restrictions, the choice fell to the LED lighting system SUPERSYSTEM. With optimal illumination also from large distances the track-mounted LED spots integrate perfectly in the architecture. The anodized aluminium surface of the compact, movable spotlights also matches discreetly with the glass cases and shelves.

Installation of the 200 individually controllable LED spots was optimised by the LUXMATE EMOTION lighting management system, which enables programming of different light scenarios for dynamic configuration of the light mood – depending on individual requirements or the time of year and day. This allows Ladurée maximum flexibility in the presentation of macaroons, pastries, chocolates and other delicacies.

BUILDING OWNER Ladurée, Paris/F  
ARCHITECTURE Mercure Engineering & Consulting, Boulogne-Billancourt/F  
LIGHT PLANNING Voyons Voir, Paris/F  
ELECTRIC INSTALLATION Amperelec, Montrouge/F

LIGHT SOLUTION LED lighting system SUPERSYSTEM,  
LUXMATE EMOTION lighting management system

# Understanding People and Light in the Office

A global user study on light quality in the office conducted with the Fraunhofer Institute for Work Management and Organisation (IAO) provides ground-breaking findings

PHOTO Zumtobel TEXT Roland Pawlitschko





**“The study already shows that it is necessary to focus more strongly on individual preferences for light qualities. Diversified, user-based solutions and adaptable light and control elements will be essential in the offices of tomorrow.”**

Dr. Jörg Kelter of the “Workspace Innovation” department at the Fraunhofer IAO

Standards, directives and ergonomic assessment criteria today define the planning of light solutions for office workplaces, while emotional, cultural, age and job-specific contexts or individual user preferences tend to be of secondary importance. To learn more about the perceived and expected quality of light in the office, Zumtobel conducted a user study developed together with the Fraunhofer IAO. The goal of the researchers, with this long-term study, is to have numerous different users evaluate the perceived lighting quality in different office situations in order to obtain an accurate picture of what light is best suited for whom and in what situation. The essential instrument of the study is a multi-language online questionnaire, which made it possible for people from around the world to participate.

Among the most remarkable findings of an initial report of the results by the Fraunhofer IAO is the extraordinary number of participants. Within the first five weeks alone a total of 2,200 office employees from Europe, Asia, Australia and the USA filled in the questionnaire to evaluate the light situation of their personal work environment. More than 60 % of the participants indicated that they wished to be informed of the results of the survey for Dr. Jörg Kelter of “Workspace Innovation” at the Fraunhofer IAO not only an “indicator for a high degree of interest in the study, but also evidence of how important the ‘right’ light solutions are to people”.

Fundamentally it can be said that the majority of the participants are happy in their workplace and also assess the light quality overall as reasonable to good. It is also interesting that almost 68 % of those surveyed spend 16 to 20 days at the office, which means that 32 % of the people frequently work in a mobile environment. No matter whether their workplaces remain unoccupied during their absence or are used by colleagues – both efficient and individually controllable light solutions are essential in any case. Only then is it possible to provide the light exactly where it is actually needed, based on the needs of the people who use the space.

A closer look at the personal preferences shows that although 51 % of those participating in the study have direct lighting at their disposal, it is actually desired in only 17 % of these cases. On the other hand, 83 % were in favour of light scenarios with differentiated light solutions, diverse luminaire types and direct/indirect illumination. A deeper analysis indicates that office employees with

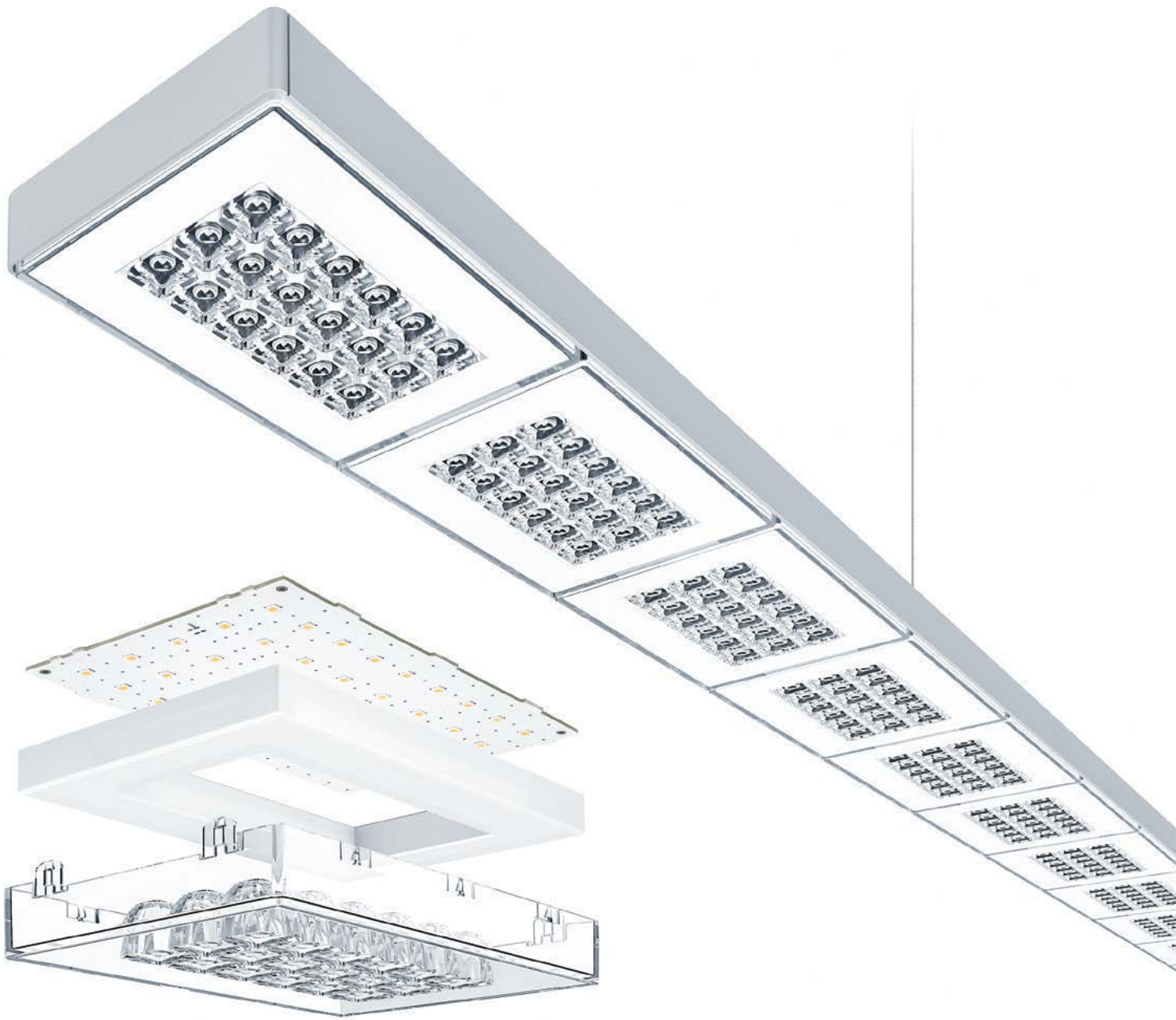
direct/indirect systems at the workplace fundamentally feel more comfortable than office employees with direct lighting. The user study shows that there are clear preferences in light levels and colours. With respect to brightness, 500 and 800 lux are considered to be especially pleasant. Astonishingly, almost 60 % of the participants vote for  $\geq 800$  lux – a value that is considerably higher than the minimum luminous flux of 500 lux required by workplace regulations. With respect to the colour temperature, a total of approximately 87 % of those surveyed clearly preferred 3,000, 4,000 and 5,000 kelvin. Fulfilling these different individual preferences requires luminaires with adaptable colour temperature. That this is by no means important only for the darker winter months is shown by analysis of the operating times for artificial lighting. 60 % of those surveyed, said they used artificial light for more than seven hours a day in winter months, while the comparison value for summer was still impressive at 33 %. One reason for this could be that 61.2 % of those surveyed reported that they do not sit in the immediate vicinity of a window. These figures illustrate how high the need for artificial light is and how important it is to coordinate the use of daylight and artificial light. At the same time, large potentials for improved efficiency become apparent, for example through the use of controllable light solutions.

After analysis of these initial findings one thing is clear: modern office lighting has to be both individual and intelligent, as well as easy to control. Customer solutions can then easily be tailored to the individual needs of the users, to create ideal light conditions for diverse room and light situations that in the end contribute significantly to the wellbeing and health of human beings while creating the optimal combination of light quality and energy efficiency.

# Light to the Point

For their workplaces people require different light solutions with diverse control options. On the basis of this central finding of the current user study Zumtobel developed the new SEQUENCE LED luminaire.

PHOTOS Zumtobel TEXT Roland Pawlitschko



One SEQUENCE module features 18 centric and 24 external LEDs with a special lens optic. All important elements are therefore in harmony for perfect glare reduction, directed light and optimal light quality.



## “With the individual control of LED segments in SEQUENCE we achieved a revolutionary product solution – a luminaire that creates new benefits.”

Zumtobel product manager Sebastian Schubnell on the development of SEQUENCE

The desires and preferences of people's perception of the “right” light in the office is extremely diverse and dependant upon their job and working environment. To support the health and well-being of office employees on the basis of this insight, Zumtobel pursues holistic approaches that allow individual and intelligent light solutions that are also easy to control. SEQUENCE is the successful development of a completely new concept for LED pendant and surface-mounted luminaires; it is based on the user's basic need for individuality and also exhausts the current possibilities of LED technology with respect to all criteria – from the design to the entire electronic system and the controller.

The first step in what proved to be an intensive product development process was to put together an interdisciplinary development team of luminaire and system developers, light technicians, product managers, trend specialists and external partners, such as light planners and architects. Before starting with the development of a specific product, however, the team members first had to take a step backwards. They collected basic knowledge, e.g. with the aid of a study conceived in cooperation with the Fraunhofer Institute (see p. 46), and also asked additional questions: How to succeed, for example, in putting the right light exactly where it is needed? And what does it mean for the design of LED luminaires if they are not only to be adapted, but fundamentally re-designed? Finding the answers to these questions finally led to the development of small LED modular units that today characterise the design and functionality of the SEQUENCE.

SEQUENCE consists of 14 modular units of identical design, each with 6×3 LED light spots and arranged consecutively in a flat aluminium casing. A special lens optic ensures optimal glare reduction of the actual working light in front of each of the 18 centric LEDs despite the small dimensions. Meanwhile, by means of an opal cover frame, the 24 external LEDs allow diffused ambient light and soft light distribution.

To adapt the light quantities in the direct component of the luminaire to the individual requirements of users or also to the changing daylight situation, SEQUENCE was divided into three segments. The four external and six centric modules each form an independent, DALI-controllable unit – a fourth DALI address went to separately controllable LEDs for indirect room lighting at the top of the luminaire body. The use of high-performance lighting management systems such as LITECOM expands the control options considerably. It is possible to do more than just switch single segments on and off or dim them separately. Thanks to the

integrated intelligent technology, the light within the luminaire can also be “shifted” in soft, flowing transitions from module to module.

Despite this extraordinary performance, which offers users maximum flexibility, the team of developers succeeded in developing a remarkably compact and architecturally designed LED pendant luminaire that fits into the design of any work environment. The finely crafted appearance is due in part to the fact that the converter and all electronic components are accommodated in a slightly upward raised area of the luminaire body – and not, for example, in a hard-to-access or aesthetically displeasing box in or under the ceiling.

The sense of lightness conveyed by the SEQUENCE today to a certain extent was also typical of the entire development phase. At the Zumtobel head office in Dornbirn, for example, a kind of “think workshop” was set up especially for the members of the team: for experimenting, thinking, working and presenting at any time of day or night. Part of this thinking process was relatively open from the very beginning with the option of being able to combine single modules in another quantity or form for possible future expansion of the SEQUENCE product family. In this respect, this LED luminaire enables not only individual light solutions for the office environment of today, but also gives an outlook on the potentials for the “digital light” of tomorrow.

# Campus of Knowledge

University of Economics and Business in Vienna

PHOTOS Bruno Klomfar TEXT Wojciech Czaja



The Vienna University of Economics and Business (WU) in the Green Prater is not only one of Vienna's biggest new construction projects; it is also a milestone in Austria's educational infrastructure. The university campus, erected in cooperation with the Austrian federal real estate company Bundesimmobiliengesellschaft (BIG), comprises different buildings whose planning involved six architecture studios from around the world: Zaha Hadid of Hamburg, Peter Cook of the London-based Crab Studio, NO.MAD Arquitectos of Madrid, Carme Pinós from Catalonia, the Japanese architect Hitoshi Abe and Laura Spinadel of the Viennese studio BUS. The result, wild and wonderful, is a playing field of contemporary architecture.

The centre of the spacious nine hectare campus is the Library & Learning Centre (LLC) designed by Zaha Hadid. With its sharp corners and bold lines the expressive building, which leans forward far over the forecourt, evokes the image of a futuristic command centre. The interior is also dominated by spaceship aesthetics with dramatically slanted walls, rounded edges and long, narrow walkways extending from one end of the room to the other. The LLC is flanked mainly by black & white, plain office and institution buildings. In striking contrast: the Teaching Center



The heart of the campus is the Library & Learning Centre designed by Zaha Hadid. Different colour temperatures and individual orientation of the illumination provide for apt accentuation of the different functions and areas of the building.

(TC), clad in Corten steel, and the red-orange-yellow Institute Cluster designed by Peter Cook.

The heterogeneous styles of the six planning architects also presented a challenge for the light planners. On the one hand it was necessary to adapt the light concept to the particular architectural character, alternating between subdued and dynamic; on the other hand, the number of products had to be reduced to a minimum with a goal towards efficient facility management. The end result: a total of 12,000 luminaires – including pendant luminaires, hidden cove luminaires and numerous individual light solutions – as well as seven kilometres of continuous row lighting.

The entire campus, which currently accommodates about 23,000 students and 1,500 employees, was designed in accordance with the green building concept. Of course, that also means installing efficient and sustainable light products, such as the SLOTLIGHT II light line, the CLARIS II pendant luminaire and LED luminaires of the PANOS INFINITY series. All lighting systems in the buildings are controlled by a common KNX bus controller; motion detectors are used to control the lights in the stairways and

sanitary facilities, while the offices are equipped with a special light control system to optimise the use of daylight. In comparison with conventional solutions this combination uses far less energy.

One special aspect of this project: In addition to Zumtobel's role as a commercial enterprise, the company was also responsible for the entire installation, in the form of a joint venture with four electrical installation companies.

BUILDING OWNER Projektgesellschaft Wirtschaftsuniversität Wien GmbH, Vienna/A; Library and Learning Center (LLC): BIG Bundesimmobiliengesellschaft mbH, Vienna/A  
ARCHITECTURE (LLC) Zaha Hadid Architects, Hamburg/D  
LIGHT PLANNING (LLC) Arup, Lighting Design, Berlin/D  
ELECTRICAL PLANNING (LLC) Vasko + Partner Ingenieure, Vienna/A  
ELECTRIC INSTALLATION ARGE KM/E (Klenk&Medler / EMC), St. Pölten/A

LIGHT SOLUTION LED downlight PANOS INFINITY, LED light line SLOTLIGHT II, pendant luminaire CLARIS II, moisture-proof luminaire SCUBA

The new WU campus is a playing field of contemporary architecture. The light design takes this into account.





# The Golden Touch

Illwerke Centre Montafon in Vandans



PHOTOS Jens Ellensohn TEXT Wojciech Czaja



Like a huge, 120 metre long wafer bar the new Illwerke Centre Montafon (IZM) stands between the street and the visitors' parking lot, pointing out toward the lake. With a usable area of 10,000 square metres, the five-storey hydro-power competence centre of the Vorarlberg Illwerke AG is one of the world's biggest office buildings erected using hybrid timber construction. The building was planned by the Vorarlberg architect Hermann Kaufmann. On the basis of a master plan from Kuess / Hörburger, Kaufmann emerged as the winner from a total of 13 competitors.

His concept: the entire building was based on a modular principle with serial components. Surface-joined pillars integrated in the façade support wood-concrete composite elements, which are held in the middle axis by a steel girder. The wood façade itself is protected by canopies from the effects of weather and overheating in the summer. If the current capacity for 270 employees should ever prove to be insufficient, additional storeys can be added to the building at any time. The necessary static measures have already been taken.

Inside, the foyer is very impressive with a coloured light installation by Miriam Prantl. The interior would of otherwise, been dominated by wood. The artificial lighting of the interior takes this



The office building is an example of timber architecture that stands for sustainability. This idea continues down to the last detail.

## PROJECTS

into account: with the exception of the conventional luminaires in the basement, all luminaires are executed as LED versions. Essentially, the lighting consists of custom LED light lines that are adapted to the exact characteristics of the different areas and emphasise the extremely long length of the office building. All workplaces are located near the large window areas on both sides to ensure the best possible combination of daylight and artificial light. The design of the ceiling as a heating/cooling ceiling required the use of surface-mounted instead of recessed ceiling luminaires. With a micro prism lens and a UGR value below 19, they provide optimal, homogeneous and glare-free light at the workplace. In addition, the approximately 1,000 luminaires were manufactured in a customised size of 100 x 1,845 millimetres and arranged to enable future flexibility of the workplace layout.

Linear luminaires (SUPERSYSTEM special versions) installed in the middle zones of the offices had to be integrated to fit exactly into the pre-fabricated architectural elements. They illuminate the communication or retreat areas which are furnished in colourful contrast to the wood appearance. The 40 millimetre wide LED light lines are combined with oak trim over a length of several

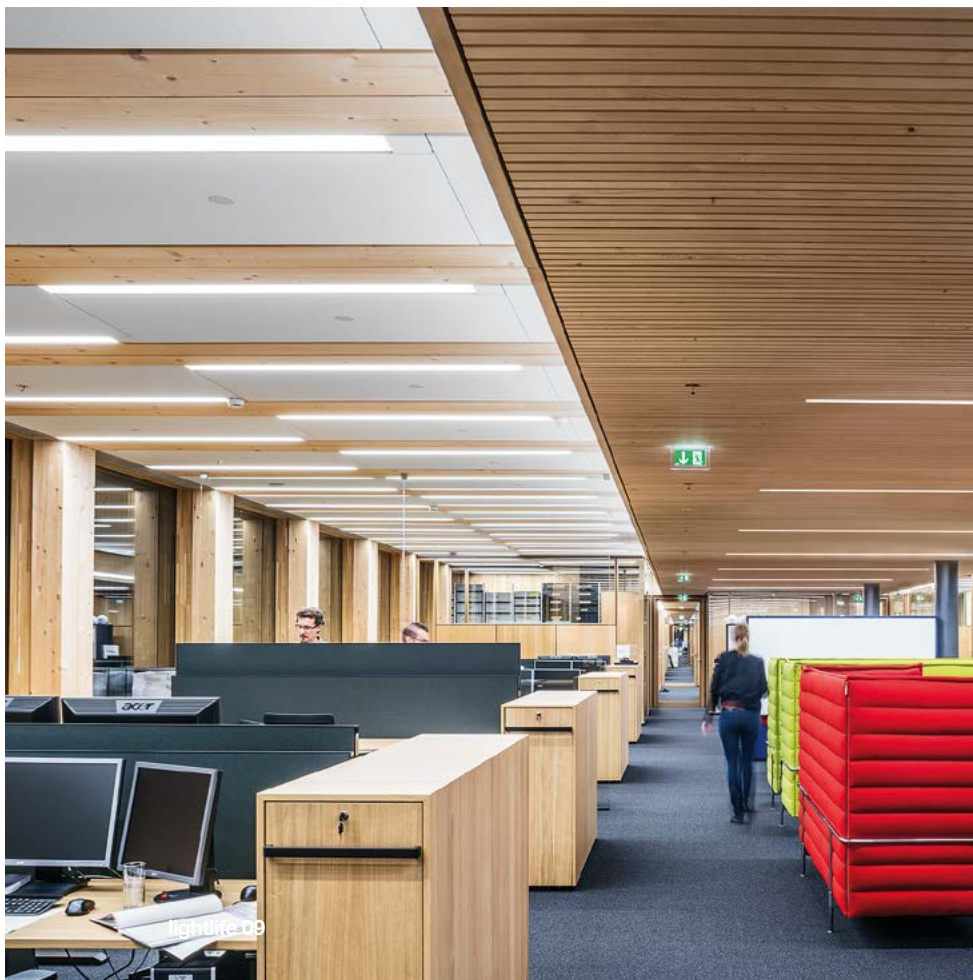
metres. The disguise is perfect – not the luminaire, but only the light is visible.

All luminaires are connected to daylight sensors and motion detectors. Due to the HVAC engineering and lighting concept, the IZM was designed as a green building. It was also awarded a gold certificate by the Austrian Society for Sustainable Real Estate Management (ÖGNI).

BUILDING OWNER Vorarlberger Illwerke AG, Bregenz/A  
ARCHITECTURE Hermann Kaufmann ZT GmbH, Schwarzach/A  
LIGHT PLANNING Manfred Remm, Dornbirn/A  
ELECTRICAL PLANNING el Plan Elmar Lingg ELECTRICAL PLANNING, Schopponau/A

LIGHT SOLUTION Workplace lighting: Special solution LED surface luminaire; LED light line SLOTLIGHT, LED light system MICROTOOLS, LED light system SUPERSYSTEM as special solution, TECTON continuous row lighting system, CARDAN LED spotlight system, SCUBA moisture-proof luminaire, PERLUCE luminaire, PANOS LED downlight with special colour, FD 1000 LED downlight

The linear luminaires are integrated to fit exactly into the building's timber construction. Minimalistic spots set accents in the corridor.



# Interplay of Reflections

K&L Gates Law Office in London

PHOTOS Richard Bryant TEXT Wojciech Czaja

The One New Change shopping and office complex, designed by the French architect Jean Nouvel and developed by Land Securities, undoubtedly boasts the largest and most impressive mirror in London's inner city. Ever-changing fragmented images of the mighty Saint Paul's Cathedral are reflected in the dramatic, multi-faceted façade. The global law firm K&L Gates has set up business on two of the building's four office floors.

Washington-based architects LSM designed the 10,000 square metre office area in cooperation with lighting designer Christopher Seider of Seider Design in Berlin. "For the international expansion of K&L Gates, we developed a clear and modern aesthetic with a unique synergy of light, spatial expression and incorporating of artwork," says Debra Lehman-Smith, design partner at LSM. "Important aspects of this concept are the use of daylight and integration with the surrounding environment."



From the reception area, the café and the large conference rooms, one has a direct view of the dome of the Baroque cathedral amidst multifarious reflections. The interplay of space and illusion is so typical of that period in history and it continues in the contemporary manner in the K&L Gates interior spaces. Customised continuous row SLOTLIGHT from Zumtobel provide the basic lighting by accenting the edges of the ceiling planes and columns. The light axes are mirrored in the numerous transparent glass interior walls, overlapped with fragmented Baroque images. The continuous row lighting also serves to subtly delineate the different areas of the office: while a colour temperature of 3,000 K dominates the general areas, the workspaces are illuminated with 4,000 K.

The result of this intensive cooperation between the architect, lighting designer and luminaire manufacturer is a simple, elegant and characteristic continuum of lines, images and space. Or, as the architect Debra Lehman-Smith says: "We have been working with K&L Gates for nearly 20 years. But the London project is truly the pinnacle of this process."

PROJECT DEVELOPER Land Securities, London/UK  
 ARCHITECTURE LSM, Washington/US  
 LIGHT PLANNING SeiderLighting Design, Berlin/D  
 ELECTRICAL PLANNING Hilson Moran Partnership, London/UK  
 ELECTRIC INSTALLATION Phoenix Electrical Company Ltd, London/UK

LIGHT SOLUTION Light line SLOTLIGHT, special solution SLOTLIGHT LED, downlights 2LIGHT MINI, security lights RESCLITE, ARTSIGN



# Simulated Daylight for Research

Peter Doherty Institute at the University of Melbourne

PHOTO Glenn Hester TEXT Wojciech Czaja

The University of Melbourne is an official Gold Sponsor of the Green Building Council Australia, which since its inception in 2002 awards the nationally coveted “Green Stars” for ecologically outstanding projects. As part of university policy, every renovated and new building on the university campus strives to achieve “Green Star” certification. The recently completed Peter Doherty Institute, which is considered the southern hemisphere’s only research institute of its kind, was awarded five “Green Stars”.

“In a complex lab building like this one, power consumption is five to ten times higher than in a conventional office building,” says Chris White, Executive Director of Property and Campus Services at the University of Melbourne. “It is very important for the building to make a significant contribution to saving energy and resources.” The result is a ten-storey high-tech building with 25,000 square metres of floor space, co-generation, grey water utilisation and a green roof landscape. The Peter Doherty Institute is designed to use 50 percent less electricity than a similar building of comparable size.

The planners behind this highly efficient structure, whose north side facing the sun is clad with a double-shell curtain façade, are the internationally based Grimshaw Architects in cooperation with Billard Leece, an academy specialising in research and health facilities. To save on production-intensive materials such as aluminium, the construction incorporated \$5.2 million in FSC-accredited timber. In addition, the design maximises the use of daylight wherever possible. Not so in some of the laboratories. The stringent requirements in some areas made it necessary to eliminate daylight to the greatest extent possible. Some 2,000

MELLOW LIGHT V office luminaires have been installed. With 1.25 watts and 100 lux per square metre, the surface-mounted luminaires were configured and positioned to imitate bright sunlight from skylights. With as many as 700 researchers working at the “Doherty” it is necessary to provide them with the best possible working conditions and create a friendly atmosphere conducive to concentration and motivation.

In the other areas of the “Doherty”, unobtrusive, harmonious light sources are used. The challenge was to limit the light and shadow to enhance the flowing geometry and intensify the visual effect of the organically formed wooden ribs. Natural materials were used throughout the space, so linear luminaires help enhance the organic forms that act as a counterbalance to the austere and purposeful design of the laboratory spaces.

**BUILDING OWNER** The University of Melbourne, Melbourne/AUS  
**ARCHITECTURE** Grimshaw Billard Leece, Melbourne/AUS  
**LIGHT PLANNING** S2F/SKM, Melbourne/AUS

**LIGHT SOLUTION** Surface-mounted luminaire MELLOW LIGHT V, LED light line SLOTLIGHT, light line LINARIA, LED downlight PANOS INFINITY, LED lighting system MICROTOOLS

**ACKNOWLEDGEMENT** The Peter Doherty Institute is an un-incorporated Joint Venture Partnership between the University of Melbourne and Melbourne Health. The Doherty partners and their affiliates gratefully acknowledge the significant funding assistance provided by the Commonwealth Government’s Education Investment Fund and from the Victorian Government.



# Exquisite Wrapping for Art

Museo Jumex – Latin America's largest private art collection moves into new expressive quarters in Mexico City

PHOTOS Simon Menges. TEXT Eva Steidl









David Chipperfield is a long accepted member of the architecture elite. His unique approach to space, material and light allows him to create buildings with special clarity and tranquillity. Since the New Museum Berlin, his most extensive project so far, the Briton is regarded worldwide as a specialist for complex museum buildings. For the important art collection Jumex, Chipperfield has now completed a museum in Mexico City that offers a convincing combination of flowing spaces and skilful lighting.

Polanco, situated in the western part of Mexico City, is one of the capital city's luxury districts. A former industrial area at the edge of the district was developed as part of a comprehensive urban master plan a few years ago. Between the glass façades of office buildings and apartment blocks that dominate the cityscape, a modestly monolithic structure with a sawtooth roof stands out: David Chipperfield's design, and the new home of the private collection of the Mexican fruit juice empire Jumex. Formally, the building is reminiscent of industrial halls such as those that can be seen in Ecatepec on the outskirts of the city. That is where the private collection – considered the greatest contemporary art in Latin America, with works by Jeff Koons, Andreas Gursky and Gabriel Orozco – was previously on exhibit in a hall on the company premises. While the majority of the administration and the depot remained there, Chipperfield's building in the city centre serves as a new satellite with an exhibit area of 4,000 square metres.

The spatial separation of the two functional areas enhances the museum's concept, in which flexibility plays a central role:



The artificial illumination of the exhibit areas is achieved with trackheads recessed in the ceiling and equipped with ARCOS spotlights that were specially modified for the project.

a substantially streamlined administration area is located in the underground level of the four-storey building together with the temporary storage and operational areas. All of the other levels are therefore entirely free for exhibition activities. The pleasant climatic conditions in Mexico City are reflected especially in the open character of the ground floor: outdoors and indoors blend together here, because the building was erected on a column structure that allows visitors to enter from all sides. Extensive glass surfaces and large wooden portals that define the entrance open the view onto the surroundings.

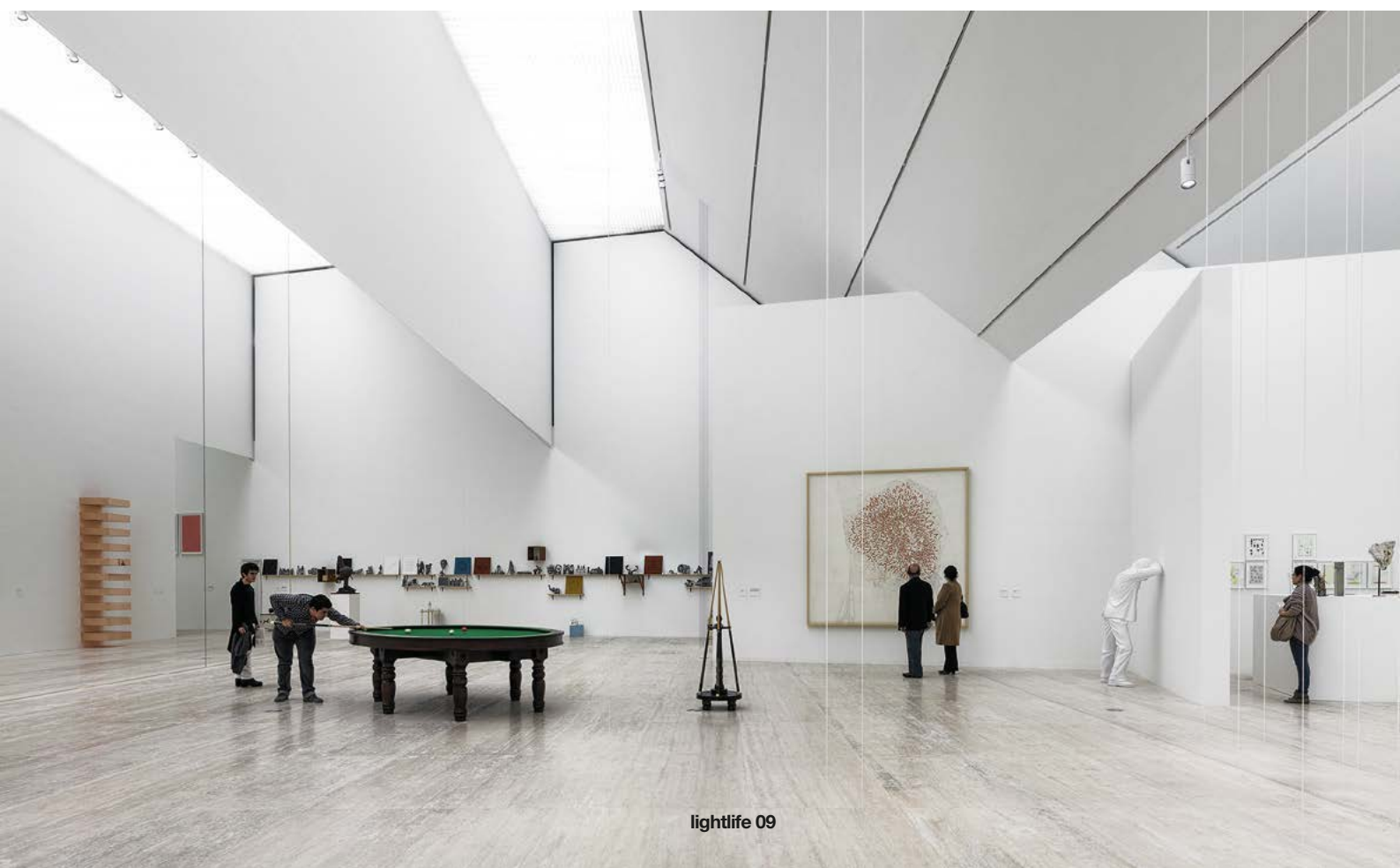
For the façade and the sawtooth roof, Chipperfield and his team used travertine from Xalapa (Veracruz). The use of limestone is a reference to traditional Mexican craftsmanship techniques and reinforces the striking geometry of the building, which is especially effective in dialogue with the surroundings. On the one hand, the Jumex Museum is located in the direct vicinity of Carlos Slim's private museum – a curved metal building – and the Cervantes Theatre, a structure that appears to sink into the ground. On the other hand, the museum property is bordered by a thoroughfare and a freight railway track. Not the ideal location to create a place for art and contemplation. But that seems to explain exactly why David Chipperfield's elementary spatial concept on the wedge-shaped ground plan is so effective. The spacious gallery room on the top floor remains closed toward the sides. Chipperfield skilfully focuses the light entry via recesses in the four steep jags, while a small number of room-high window openings on the exhibition floors allow daylight to enter the building.

The lighting concept follows David Chipperfield's feeling for the precise mixture of natural and artificial light. The visitor's

glance is selectively guided outwards while the light sources on all floors carefully focus on the exhibition areas. The museum's flexible spatial concept presented a special challenge with respect to the planning and implementation of an ideal light design. In close cooperation with planning teams from Arup and Zumtobel, the Chipperfield staff created specific lighting scenarios for diverse exhibition situations. The goal was to configure a system that was efficient and easy to operate in-keeping with the simple character of the building.

The focus on the ground floor and the 1<sup>st</sup> floor is therefore on variable general lighting. Designed for events, conferences and workshops, these two storeys are illuminated by special ARCOS recessed ceiling luminaires. They not only allow, a discreet, homogeneous installation, but also specific illumination of single areas. If there is a need for illumination of temporary exhibits or three-dimensional objects such as sculptures, LED downlights can be substituted for the ARCOS luminaires.

The two upper floors are designed entirely as exhibition areas and are accordingly equipped with lighting technology. With a room height of five metres, the second upper floor can be divided by partition walls. Daylight enters the room through a north facing window with access to the terrace, and textile curtains provide anti-glare protection while allowing an outside view. This level is additionally illuminated by a track system mounted in the ceiling that can be adapted to every conceivable exhibition requirement. Adjustable spots can be regulated to provide both basic and accent lighting. ARCOS boasts technical features developed especially for this application: David Chipperfield designed the extremely compact spotlight for Zumtobel in 2008 and revised



it in 2013. The architect contributed his extensive experience in building museums to the development of a technologically innovative design luminaire for the most stringent conservational requirements. Testing of the luminaires in the room was especially important to him. Also at the focus: the perspective of the user, which Chipperfield also included.

With the Jumex project, Zumtobel and David Chipperfield resumed the cooperative design process for several individual solutions: For the two exhibition levels the luminaire development team designed special features for ARCOS, including an extended arm, single sockets and LED versions with excellent colour rendering (Ra90) and a colour temperature of 4,000 K. They are also used in the 3<sup>rd</sup> upper floor for accent lighting. A continuous row lighting system provides for even illumination of the floor – because the complex roof geometry requires a detailed scenario for the interplay of natural and artificial light. Daylight enters this level through skylights in the sawtooth-like jags. The light is scattered by means of a multi-layer system of matte glass and semi-transparent acrylic and is admitted into the room through matte white blinds. At night and in the case of reduced light intensity, the ZX2 continuous row lighting system installed in the skylights and the configured ARCOS spotlights, with special lenses and filters, ensure optimal light quality for homogeneous illumination of the exhibits. The flexibility of the configuration here also allows alteration and division of the spatial dramaturgy of the total of 860 square metres, with no loss of the sense of spaciousness. Additional continuous row luminaires are installed for added, accented illumination of single objects in the room. Control of the respective luminaires in the gallery and office rooms is achieved by means of the lighting management system LUXMATE BASIC.

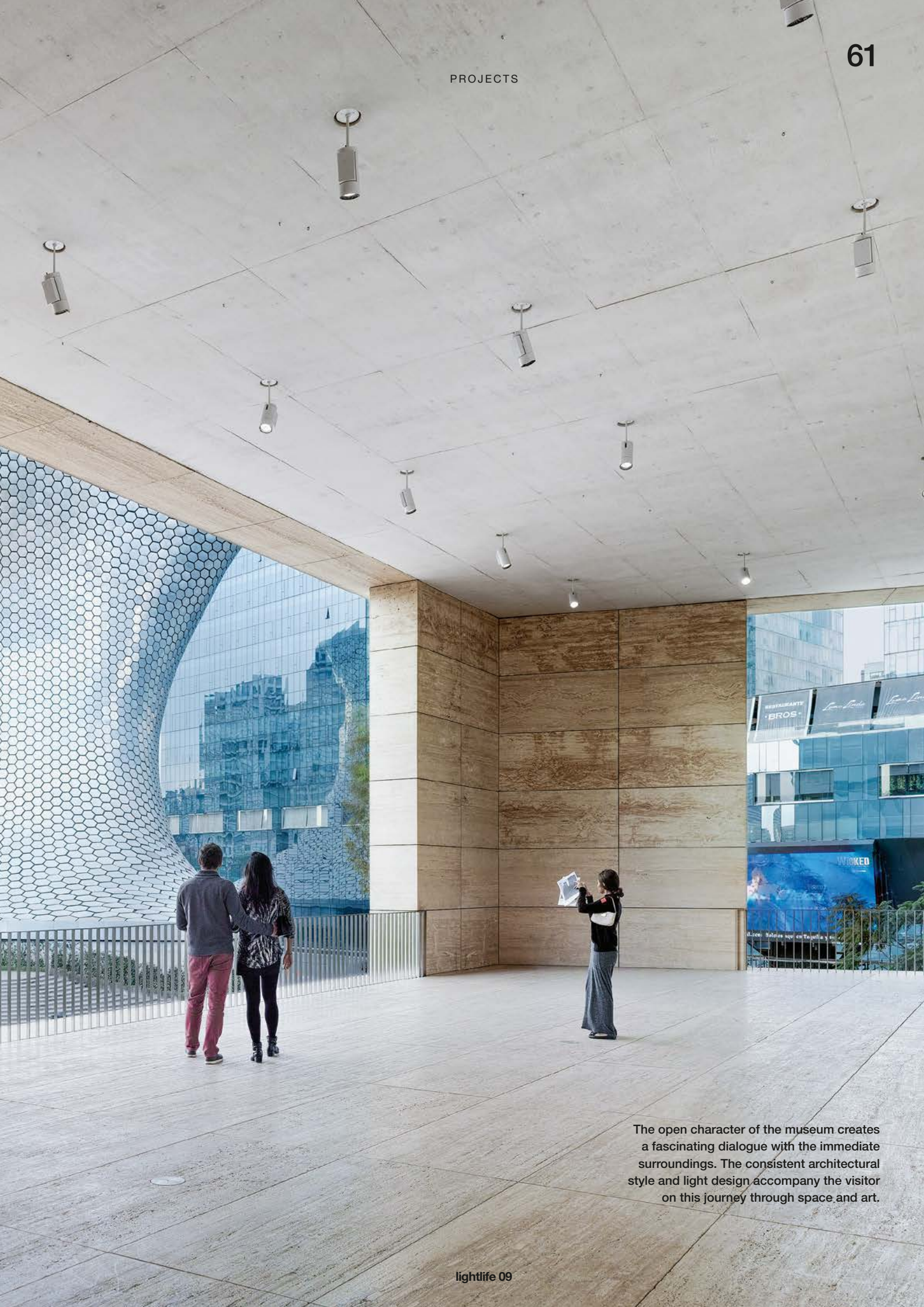
Despite these technical refinements, David Chipperfield's museum building is not ostentatious, nor does it use grand gestures to impress its visitors. Yet the simple form and stringent geometry, evocative of a plain industrial building, have a captivating effect in the cultural context of Mexico City. The clarity with which Chipperfield uses light and perspectives is as impressive as the result that emerged from the cooperative development of complex light solutions for the Museo Jumex.

BUILDING OWNER Eugenio Lopez, Mexico City/MX  
 ARCHITECTURE David Chipperfield Architects, London/UK  
 EXECUTION PLANNING TAAU –Taller Abierto de Arquitectura y Urbanismo, Mexico City/MX  
 LIGHT PLANNING Arup, London/UK

LIGHT SOLUTION LED spotlight ARCOS, downlight PANOS Q, LED downlight PANOS INFINITY, LED downlight DIAMO, LED surface-mounted luminaire SLOTLIGHT II, ZX2 continuous lighting system, batten luminaire LINARIA, moisture-proof luminaire SCUBA, moisture-proof luminaire CHIARO II, emergency lighting ONLITE, tubular luminaire TUBILUX, LED downlight MICROS, lighting management system LUXMATE BASIC







The open character of the museum creates a fascinating dialogue with the immediate surroundings. The consistent architectural style and light design accompany the visitor on this journey through space and art.



# Spotlights







### Comfort and energy savings Office building in Lustenau/A

"More convenience with less energy" is the motto of the architect Dietmar Eberle for the new six-story building "2226" in the Austrian state of Vorarlberg. The name of the building "2226" refers to the temperature spectrum between 22 and 26 degrees Celsius, which is perceived as pleasant by most people around the world. Thanks to an ingenious system consisting of traditional and modern construction methods, this temperature is maintained constantly in the building – without the use of heating or air conditioning. Instead, Dietmar Eberle relies on the optimal utilisation of daylight, high ceilings and large room depths, effective air circulation and solid walls. With the aid of innovative software it is also possible to take into account the weather conditions and the number of people present in the building. For this revolutionary architecture project Zumtobel developed a suitable lighting concept that fulfils the architect's high standards of efficiency, design and multi-functionality.

With an area of nearly 2,500 square metres the office building houses Eberle's architecture studio "be baumschlager eberle", as well as other offices, a cafeteria and two famous galleries.

The light solution is optimally adapted to the different lighting requirements. The decorative LINARIA luminaire provides for general lighting and ideal light conditions for orientation of the residents and visitors throughout the building. Optimal illumination of the office workplaces is ensured by functional and aesthetic standing luminaires. LED spots of the PANOS INFINITY series deliver very high-quality light for homogeneous general illumination of the traffic areas on the office floor.

BUILDING OWNER Baumschlager Eberle, Lustenau/A  
ARCHITECTURE Baumschlager Eberle, Lustenau/A  
LIGHT PLANNING Symetrys, Lustenau/A  
ELECTRICAL PLANNING Graf Elektro, Dornbirn/A  
ELECTRIC INSTALLATION Graf Elektro, Dornbirn/A

LIGHT SOLUTION LINARIA batten luminaires,  
PANOS INFINITY LED downlights



### Fascinating transformation

Mathematical-Physical Salon in Zwinger, Dresden/D

After a six year renovation, the Mathematical Physical Salon in Dresden's Zwinger, reopened to the public in April 2013. The experiment gallery of Saxon's electoral prince was founded in 1728 and today is the oldest museum within the building complex. The new exhibit design by Holzer Kobler emphasises the architecture of the baroque building and offers nearly twice as much space for the fascinating collection of the historical scientific instruments. Large exhibit pieces are presented free-standing, while small and especially sensitive objects are protected in glass showcases. In view of this, the lighting solution plays an important role: it accompanies the visitor through the galleries and pavilions, facilitates orientation and also highlights the objects in a targeted and gentle manner, allowing them to be experienced authentically.

A significant change within the scope of the renovation was the decision to use a 100-percent LED lighting solution. The minimalist LED SUPERSYSTEM spots are integrated discreetly and feature low power consumption and outstanding light quality. The fact that the new generation of LED luminaires emits less heat and their light is virtually free of IR and UV radiation fulfils the stringent conservational requirements of the museum. Excellent colour rendering of more than Ra 90 allows visitors to

experience the natural materials and colours of the exhibit pieces. Based on specific lighting requirements SUPERSYSTEM was installed in all of the exhibit rooms and in the public areas as flush-mounted or surface-mounted ceiling luminaires or as pendant luminaires. A further characteristic element of the new lighting solution is the interplay of daylight and artificial light. Thanks to the integrated DALI unit, SUPERSYSTEM is compatible with diverse lighting management systems. The spotlights can therefore be controlled in groups for adjustment to the prevailing light situation and to the ideal luminous intensity for the particular exhibit constellations.

BUILDING OWNER Staatsbetrieb Sächsisches Immobilien- und Baumanagement (SIB), Dresden/D

ARCHITEKT (EXHIBIT) Holzer Kobler Architekturen GmbH, Zurich/CH

ARCHITEKT (BUILDING) Studio Lungwitz, Dresden/D

LIGHT PLANNING Lichtvision Design & Engineering GmbH, Berlin/D

ELECTRICAL PLANNING Elektro Ing-Plan GmbH, Dresden/D

ELECTRIC INSTALLATION Elektro Dresden West, Dresden/D

LIGHT SOLUTION Modular LED lighting system SUPERSYSTEM





### The art of craftsmanship

Werkraum Bregenzerwald, Andelsbuch/A

The Werkraum Bregenzerwald is an internationally renowned competence centre for innovative Austrian craftsmanship in Vorarlberg. Since July 2013 the association is located in Andelsbuch, in the Werkraum House based on a design by Peter Zumthor. The building, which is reminiscent of the New National Gallery by Mies van der Rohe, is characterised by a projecting black wooden roof and a set-back glass façade, through which the landscape seems to flow. By incorporating the work of regional craftsmen, the building has become a “shop window” for the craftsmanship culture of the Bregenz Forest region. As a nerve centre and contact point for building owners and architects, the Werkraum provides room for exhibits and events, as well as a shop and a café.

The multi-functionality of the building and its open, light-flooded architecture created special lighting requirements. That is why architect Peter Zumthor placed special emphasis during the planning stage on a flexible lighting solution that enhanced the architecture of the house with no compromise in the quality of light. In addition, the lighting scheme had to create a pleasant atmosphere for visitors and employees. In cooperation with Zumtobel, a customised light concept was developed with numerous special solutions. The exhibit area exclusively features state-of-the-art LED technology with easy connection to a lighting management system. This solution allows flexible con-

trol of the illumination during events and exhibits. For perfect room acoustics a panelled wooden ceiling with thick padding was installed in the open hall of the building. By means of a specially designed suspension system Zumtobel positioned 160 LED spots from the PANOS INFINITY series here. The downlights feature homogeneous basic illumination, excellent light quality and maximum efficiency. Almost 90 VIVO swivelling LED spotlights provide for accentuated light and outstanding colour rendering, especially for highlighting single exhibit items. The TECTON continuous row lighting system ensures easy connection to the power supply and the lighting control system, as well as integration of emergency lighting. Thanks to tool-free installation, the system allows fast adaptation of the light solution to changing requirements.

BUILDING OWNER Werkraum Bregenzerwald, Andelsbuch/A  
ARCHITECTURE Peter Zumthor, Haldenstein/CH  
LIGHT PLANNING Peter Zumthor, Haldenstein/CH  
ELECTRIC INSTALLATION Elektro Willi GesmbH. & Co KG, Andelsbuch/A

LIGHT SOLUTION PANOS INFINITY LED downlight, VIVO LED spotlight, TECTON continuous row lighting system, SCUBA moisture-proof luminaire, RESCLITE LED safety lighting, PURESIGN LED escape sign and emergency luminaire



### Unified Opposites

CMP Center for Mobile Propulsion, RWTH Aachen/D

A new research building with diametrically opposed utilisation requirements: this was the challenge faced by the architects Lepel & Lepel of Cologne, which they optimally met with their design for the R&D centre for motor technology at the RWTH Aachen University. From the very beginning the planners decided to house the research and administration/teaching areas in separate buildings. This resulted in the design of two contrasting structures that reflect the different utilisations spatially and technically. The curved administrative building with its Z-shaped ground plan offers maximum flexibility in the interior. Since it is already apparent today that the administrative and instructional requirements can change in the future, the wide-spanned supporting structure allows for different room layouts. The wraparound façade banners emphasise the horizontal structure and universal usability of the building. The high windows allow ample daylight to enter from all sides to ensure even illumination of the office areas. For supplemental illumination of the workplaces with artificial light the architects sought a solution that supports the desired flexibility in the spatial layout while enhancing the formal, reductionist design of the building. Together with the agency a-g Licht based in Bonn a product was found that optimally fulfils all of the required criteria: ECOOS. The building owner was convinced not only by the high-quality light, but especially also by the long-term lower operating costs.

By way of complete contrast, the motor test centre is an introverted, elongated hall structure. The façade of darkened fair-faced concrete with only narrow slit windows emphasises this

character. Inside, the building is rigidly organised, structured and adapted to the spatial and technical conditions of the test equipment. Despite the narrow windows, which make it possible to see the interior from outside, rows of windows in the roof allow sufficient daylight to enter the two-storey hall. The TECTON continuous row lighting system provides for optimal workplace lighting and orientation. Time-tested in industrial use, TECTON combines all of the elements needed here: optimal lighting quality even from large heights, flexible utilisation of space, high efficiency and easy maintenance.

A special feature is the advanced energy concept: the enormous waste of heat generated by the motor test runs can be used to heat the building. A foresighted approach to efficient reuse of energy, which benefits man and the environment.

BUILDING OWNER Bau- und Liegenschaftsbetrieb NRW, branch office Aachen/D  
ARCHITECTURE Lepel & Lepel Architektur Innenarchitektur, Cologne/D  
LIGHT PLANNING a-g Licht GbR, Bonn/D  
ELECTRICAL PLANNING ZWP Ingenieur-AG, Cologne/D

LIGHT SOLUTION ECOOS surface-mounted luminaire, LINARIA continuous batten luminaire, TECTON continuous row lighting system, CHIARO moisture-proof luminaire, COPA high-bay luminaire





### From Product to Factory

Construction of Hall 100, VW Motor Works, Chemnitz/D

“From product to factory” was the planning principle at Volkswagen. Because the developments in innovative and eco-friendly motor technology at VW during the past years will also be implemented in the architecture of the production plants in the future. The goal is to become the world’s most eco-friendly automobile manufacturer by the year 2018. The construction of the new Hall 100 of the Chemnitz Motor Works has brought the company one step closer to this goal. In November 2013 the project was awarded the gold certificate of the German Society for Sustainable Construction (DGNB). The new hall therefore meets the stringent criteria of the DGNB, which is based on a comprehensive consideration of economy, ecology and user convenience.

According to the motto “More sustainability, less environmental impact” various workshops have been established in Chemnitz to intensively strive for ways to reduce energy consumption. A comprehensive analysis of the production process is the key to this endeavour. Above all, the production systems are analysed based on energy efficiency to make use of every potential for

optimisation. The lighting system with innovative LED technology makes a major contribution in this respect. In the mechanical production process, high-tech machining centres and complex, virtually fully automatic line controllers define the production process. This requires homogeneous illumination, which is achieved through the use with an average of 300 lux. Another requirement was dimmable luminaires and integration of emergency lighting in the continuous row lighting. Zumtobel was able to optimally fulfil all of these requirements with the TECTON LED continuous-row lighting system and integrated emergency luminaires. DIMLITE modules ensure efficient control of the continuous row lighting.

BUILDING OWNER Volkswagen AG, Wolfsburg/D  
 ARCHITECT IC-L Ingenieur Consulting Langenhagen GmbH & Co.KG Langenhagen  
 LIGHT PLANNING Volkswagen AG, Wolfsburg/D  
 ELECTRICAL PLANNING Volkswagen Elektroplanung, Wolfsburg/D  
 ELECTRIC INSTALLATION Voith Industrial Services GmbH, Chemnitz/D

LIGHT SOLUTION TECTON LED continuous-row lighting system, DIMLITE lighting control system

# Computerization Takes Command

As life gets more convenient, we nevertheless cannot afford to let go of control

ILLUSTRATION Blagovesta Bakardjieva TEXT Dr. Wolfgang Bachmann



When we picked up our new car before going on holiday, the dealer gave us the following advice: If you have a breakdown and can't continue driving, most likely the electronics are on the blink. But you have a mobility guarantee. We will send help immediately. In fact, we had to take advantage of this offer, because the car gave out shortly after we crossed the Alps. The car was dead, as if someone had stolen the battery. Contrary to expectations, the emergency mechanic appeared on the scene promptly in response to our call. He needed no tools: he only had to reach under the dashboard, pull out a small black box and replace it with another – and we were on the road again.

This is the way we would always like it to be – at home and at the workplace. A kind of mobility guarantee, that a service technician comes and repairs, free of charge, the digital projector that is without a signal, hermetically locked shutters or blind card readers. In the private household this should be well thought-out, since no matter how modest the saving intervention is, one always has

to pay for the travel time. That is why many companies have set up a hotline. A call for help, however, requires some knowledge of the product; otherwise, the dialogue can become comical: You say it flashes green and rattles when you press the reset button? The clueless among us, of course, have our own version. We tell stories of failing technology and near catastrophes as men in former times told war stories.

But are we not ourselves responsible for the demon that is supposed to give us convenience and security? Electric windows in cars are practical when we want to ask a passer-by on the passenger side for directions; we are glad when a motion detector switches on the light in a dark bicycle shed and when the stove shuts off as soon as the pot is taken from the burner: electronics accompany us with every step we take. We also halfway master our computers, but they require updates and as much care as a Tamagotchi so they can communicate with other computers. In no case do we want to do without convenience and performance. It's great when the better appliance is on sale for half price. Sometimes we are amazed that the inventors thought of something that we never missed nor would have believed possible; on the other hand, we are surprised that there is no solution for any number of annoyances.

Progress therefore maintains a fragile balance and at times only stops at the limits of what is technically possible. Because synthesizers in pop music or CAD in the architecture studio can be used to create impressive clichés.

But there is no turning back. The next upgrade in our daily life will be performed by invisible computers. Microphones and cameras will record our presence, understand our language when we request light or music or want to know what is in the refrigerator and how we could use it to make a meal. A recommended recipe will be projected onto the wall and its execution tracked, while the oven pre-heats and calculates the power consumption. Only one example. To keep fit for such a life of convenience we exercise afterwards on a computer-controlled exercising machine. "Not to exclude the possibility that the computers in the kitchen and basement will soon communicate with each other and make decisions – maybe even without us."

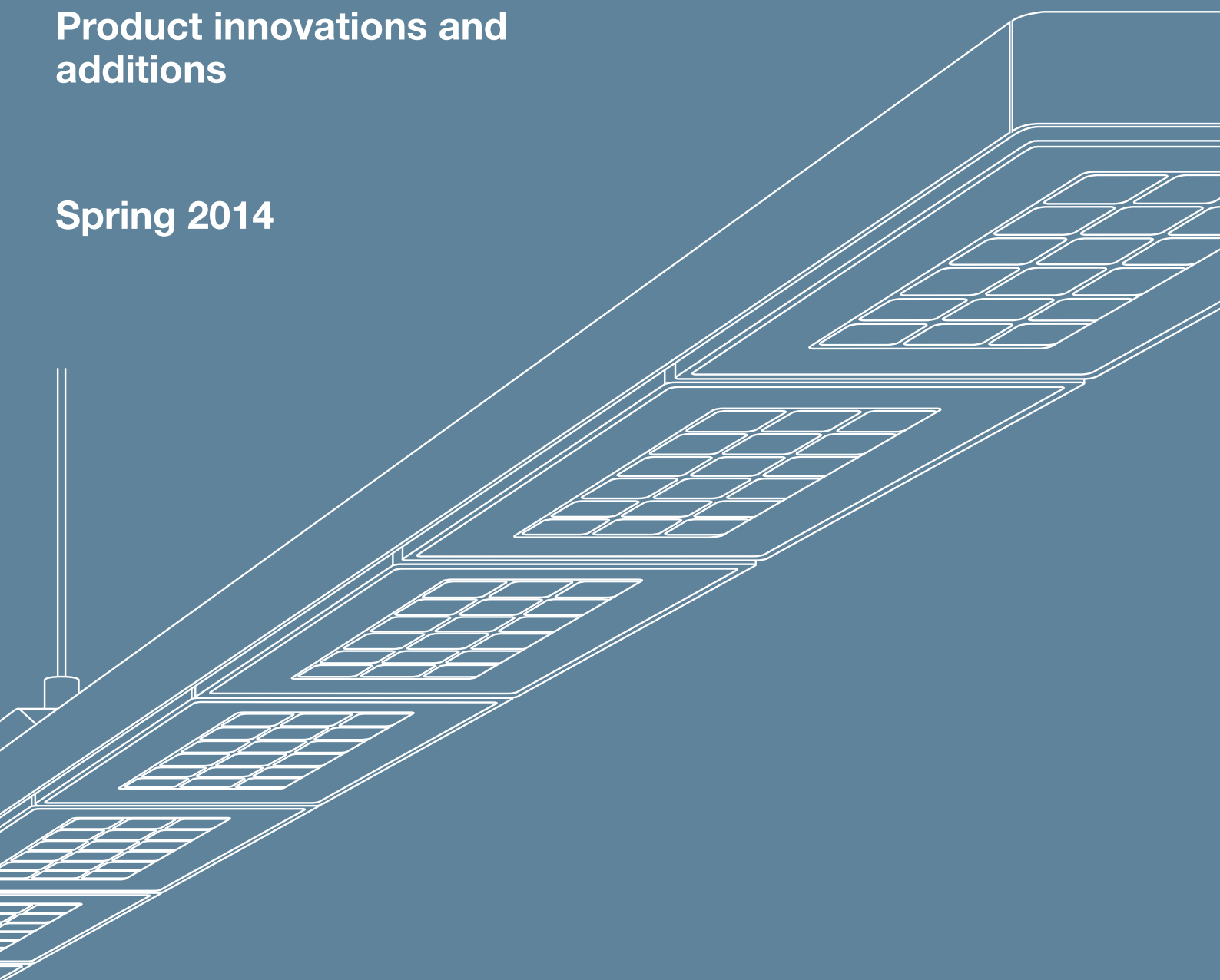
After completing his degree and gaining professional experience in architecture, DR. WOLFGANG BACHMANN worked as an editor for *Bauwelt* in Berlin, and then as editor-in-chief and, until 2013, as executive editor for *Baumeister* in Munich. He also writes reviews, commentaries and short stories for newspapers, magazines and yearbooks.



# highlights

Product innovations and  
additions

Spring 2014







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# LITECOM

1

## **LITECOM**

Lighting management system

In order to develop LITECOM, Zumtobel cooperated with the best partners from the most varied disciplines. In collaboration with IBM, they have created a pioneering and innovative open lighting management system that will forever change the world of building management. Interface designers and application experts have been involved in the project from the beginning. The result is a new form of lighting management that combines intuitive control via apps with easy installation and operation using an individual controller. For users, LITECOM means easy configuration, intuitive user guidance and maximum flexibility, which is made possible thanks to the synthesis of controller, touch panel and software within one system. This allows for the implementation, control and monitoring of individual lighting solutions that fully correspond to the specific requirements of a project: if required, additional functions can be programmed and integrated. LITECOM reduces complexity and can easily be controlled in an uncomplicated manner via any PC, smart phone or tablet using web technology.







## LITECOM APPS

Thanks to variably designed apps, there are hardly any limits regarding individual needs. From simple colour changes of the surface to complex emergency lighting control programs, LITECOM is able to meet any individual requirements users may have: for every customer, an individual app package may be compiled, depending on room functions and user demands. Based on the predefined initial settings, all functions can be controlled and adjusted as required.

It is also possible to customise individual apps especially to the functions of a particular luminaire. For instance, the SEQUENCE luminaire can be controlled and adjusted using apps especially developed for this purpose, in order to implement a perfect lighting solution tailor-made to the user's requirements.

In addition, LITECOM can also be used as a central monitoring unit for emergency lighting systems with separate battery supply. This function is implemented via the emergency lighting integration app, so that one system is sufficient to control and monitor both the ambient lighting and the emergency lighting system without any extra effort.

LITECOM is a dynamic system that is also fit for future requirements. Variable apps can be added at any time. Not only is Zumtobel thus able to extend the scope of functions on an ongoing basis, thanks to the open interfaces, users, too, can program their own apps and use them within the system. Hence, it will even be possible in the future to meet absolutely customer-specific demands, either directly by the users themselves or as a service for the customer.





### Lighting Performance Platform (LPP)

Monitoring and optimising a company's energy consumption: Zumtobel has developed the Lighting Performance Platform as an online solution for Zumtobel customers to compare consumption data of buildings and rooms at a glance, allowing for the implementation of potential energy savings. This monitoring tool is perfectly matched to lighting management systems, monitors energy consumption within a company and shows how to achieve optimum energy efficiency using lighting management. Buildings, floor levels, rooms or even individual workstations can be addressed and conveniently presented in sunburst diagrams, so that their energy consumption can be optimised.

Customised to a variety of requirements, Zumtobel's Lighting Performance Platform provides a number of services ranging from implementation and commissioning to long-term service agreements and continuous optimisation of energy consumption.



## 2

### **SEQUENCE**

Pendant and surface-mounted LED luminaire

Changing types of collaboration, whether in project teams, at the conventional workstation or in open space require flexible lighting solutions that adapt to people's individual needs. A study conducted by Zumtobel in collaboration with Fraunhofer IAO has shown that users prefer lighting solutions that can be individually controlled. The combination of direct and indirect lighting components noticeably contributes to a sense of well-being in the workplace.

The SEQUENCE pendant and surface-mounted LED luminaire is in strict conformity with these requirements. Developed from scratch – not just the design, but all its electronic components and control systems – this luminaire is the first to exploit the capabilities of modern LED technology to the full.

SEQUENCE consists of modular units of identical design that are connected in series and accommodated in a flat high-quality aluminium housing, each module incorporating  $6 \times 3$  centrally located LED lighting points. Grouped together in three logical sets, the individual modules and the indirect light component can be controlled individually. This makes adaptive lighting possible.

Continuous dimming, diffuse light emitted through the opal frame, switching of individual modules and nearly unlimited other useful scenarios are conceivable. SEQUENCE is available in a warm (3000 K) and intermediate (4000 K) colour temperature. Zumtobel supplies this luminaire in lengths of 1200 mm (8 LED modules) or 2100 mm (14 LED modules). SEQUENCE allows sustainable management in offices by providing up to 100 lm/W at a luminous flux of up to 9000 lm.





### Zumtobel advancedOptics

An individual and flexible lighting solution for the office of tomorrow, SEQUENCE combines uncluttered design and innovative lens technology that is precisely matched to its reduced height. Symmetrical or asymmetrical distribution characteristics ensure that each of the 18 central LEDs provides perfectly directed task lighting with good glare control. At the same time, thanks to an opal cover frame, the 24 outer LEDs provide diffuse ambient light as well as an altogether softer light distribution. The lenses provide high-precision light distribution and maximum efficiency as well as perfect glare control and large quantities of light. This prevents annoying reflections on screens, tablets or smart phones. The optical system of SEQUENCE was explicitly designed for LED technology.

This can only be achieved with an optical system explicitly matched to LED technology. While other lighting technologies achieve glare control of high luminous flux levels only across the surface and therefore require a correspondingly large luminaire size with diffuse lighting characteristics, SEQUENCE provides perfect glare control despite very compact dimensions at up to 9000 lm thanks to lens technology. By reflecting the injected light, the transparent lenses ensure a high level of optical efficiency for the system and thus extremely high luminaire efficiency of up to 100 lm/W.









# 3

## **LIGHT FIELDS** evolution Tunable White LED luminaire range with Tunable White technology

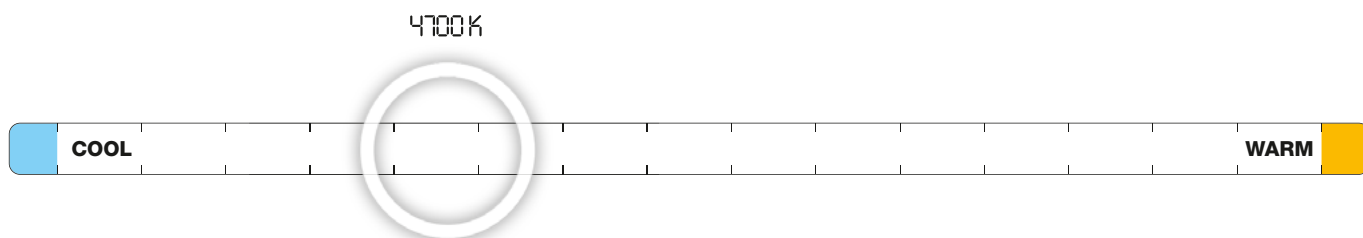
The LIGHT FIELDS evolution Tunable White LED luminaires comply with the clear and uniform stylistic idiom of the successful product range, steering it towards a user-friendly future thanks to profound application know-how and technological innovations. A current study conducted by Fraunhofer IAO – across all age groups, genders and nationalities – has demonstrated that user preferences regarding colour temperature range from 3000 K to 6000 K, with a clearly marked majority preference for 4000 K and 5000 K switching scenarios. LIGHT FIELDS evolution with Tunable White technology is Zumtobel's answer to the users' need for adaptive light that can be customised. Tunable White technology allows flexible adjustment to any room situation, catering for users' individual needs. At the same time, Tunable White enables adaptation to changes associated with different times of day and seasons; as required, the luminaire can be adjusted to the currently prevailing conditions. By extending the luminaire range, Zumtobel now offers a customisable lighting solution that can be adjusted to personal preferences and work tasks and at the same time reduces complexity for the designers.

Available from autumn 2014

DESIGN Chris Redfern, Sottsass Associati







### **Tunable White**

Tunable White allows for the intelligent adaptation of colour temperatures to changing room situations and room utilisation. At the same time, the technology is able to respond to the users' individual needs and adapt to the changes associated with different times of day and seasons. Thus, luminaires featuring the Tunable White function provide lighting scenarios adjusted to individuals.

Thanks to Tunable White technology, the LIGHT FIELDS evolution Tunable White luminaire can be continuously dimmed between 3000 K and 6000 K with a colour rendering index of Ra 80. This is made possible because of the integration of special Tridonic Tunable White LED modules together with a matching converter. Combined with state-of-the-art control units including the CIRCLE Tune control point and a lighting management system such as LITECOM, this permits the application of adaptive lighting solutions that are customised to the user's individual demands.





Recessed luminaires featuring backlit lighting technology for max. efficiency



Surface-mounted and pendant luminaires featuring sidelit lighting technology for minimum height

### 3Dprotect reflector (Recessed version)

The 3Dprotect technology (patent pending) is both protector and reflector at the same time. Its three-dimensional structure protects the LED modules during installation or maintenance and prevents damage from electrostatic discharge. At the same time, the structure's high reflection factor ensures an increase in the luminaire efficiency level.

### litePrint (Surface-mounted version)

In case of light injected laterally, the precisely calculated dot matrix of the litePrint light guide ensures uniform illumination of the complete luminaire surface. At the same time, a precisely defined light component is directed upwards in specific regions, via openings in the luminaire housing. No additional LED modules are required for the 5 percent indirect component.



# 4

## INTRO

Modular LED lighting system

Light is an indispensable tool for presenting brands and products effectively in retail settings. In addition to brand appropriate, authentic presentation, energy efficiency also plays a crucial role when it comes to implementing shop and retail lighting concepts. The INTRO modular lighting system combines various types of luminaires that use the very latest LED technology, and offers retailers an efficient lighting solution that can be fully customised to cater for various areas of a store: from shop windows, shelves and recesses through to activity spaces – INTRO can be used in any area.

An important component of the system is the innovative liteCarve® reflector technology. This innovation is based on an oval-shaped freeform reflector which – in contrast to traditional wallwashers – creates well balanced rectangular light distribution on the wall. This system spotlight has established a completely new product category – the vertical flood spotlight or vertical wallwasher. The system is based on spotlight modules that can be very easily aligned and even be combined in various lighting colours or beam angles, depending on the lighting task. Separate lighting modules and installation frames allow designers and architects plenty of creative scope: a large number of possible combinations on the ceiling underscore INTRO's great flexibility. Zumtobel offers the system in single, double and triple units, and also as a lighting channel. All the spotlight modules can be fitted with different front ring versions that are available in white, black, matt silver, chrome and copper as required. There are virtually infinite customisation options. All RAL colour hues are possible as special versions.

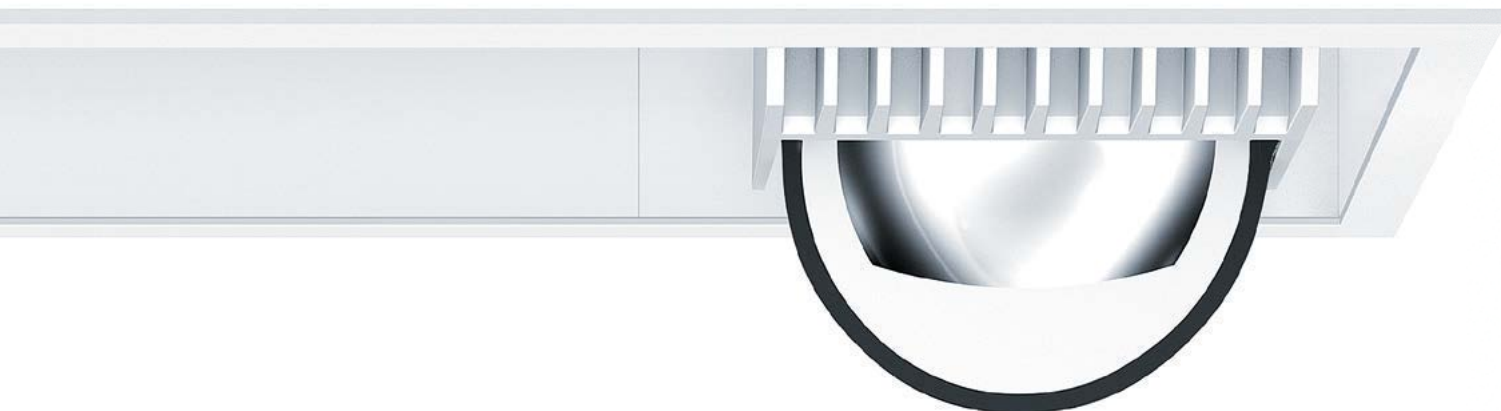
INTRO's modular design and the possibility of integrating various different spotlights provide a lighting solution that is tailor-made for LED technology, offers plenty of customisation options, and specifically caters for setting the perfect stage for brands.

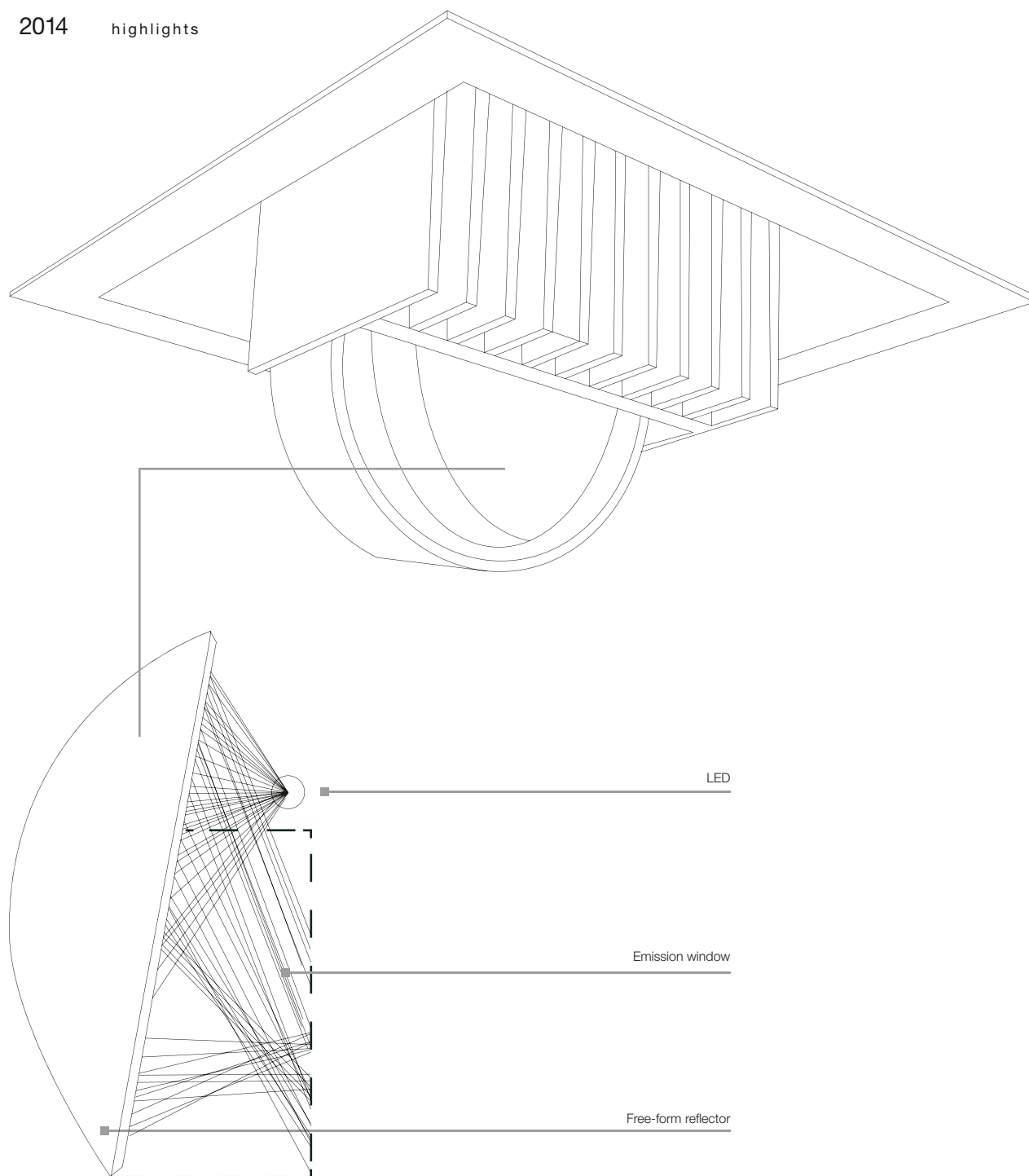
Available from autumn 2014

DESIGN Chris Redfern, Sottsass Associati









### liteCarve®

Reflector technology incorporated in the INTRO system

The liteCarve® reflector technology developed by Zumtobel offers extremely high design precision. This freeform reflector (patent pending) provides very precise, well balanced rectangular light distribution, right up to the outermost peripheries. Mounted in front of a single LED (CoB) point light source, the reflector directs 100% of the light indirectly in a targeted manner and makes it possible to bring vertical surfaces alive: this allows for uniform, efficient illumination, not only of displays, but also of shelves, large posters, recesses and specific wall areas.





# 5

## **TrueGamutRendering fashion (TGRfashion)**

LED technology for brilliant colours

White light plays a truly significant role in achieving authentic retail presentation because light is the most important component when it comes to perceiving and evaluating goods. TGRfashion technology has enabled Zumtobel to achieve new levels of shop lighting quality using LEDs. It lends a fresh quality and brilliance to white colours, but also to light and bright colours. TGRfashion displays colours with particular purity, and the LED spotlight emphasises and differentiates the various properties of different materials, resulting in a high colour rendering index. For the first time, this technology has been integrated in the size M IYON spotlight, which provides a luminous flux of more than 2000 lm.



# 6

## **PANOS**

Global LED downlight range

Thanks to excellent lighting quality, high quality materials and innovative technologies, the PANOS range is one of the most efficient and comprehensive LED downlight ranges available on the market. The luminaire is now going to provide these benefits on a global scale. The PANOS infinity and PANOS evolution LED downlight ranges are at present being extended to form a global portfolio and comply with varying requirements in the markets worldwide. The first stage includes both round and square versions of the downlight with a diameter of 68 mm or 100 mm in the colour temperatures 2700 K, 3000 K, 3500 K (in the USA) and 4000 K. Other versions will be added to the global portfolio on an ongoing basis.

Available from autumn 2014

DESIGN Chris Redfern, Sottsass Associati



# 7

## PANOS evolution LED downlight range



The new PANOS evolution downlight is a consistent further development of the PANOS concept. Efficient high performance LED modules with a colour rendering index of  $Ra > 80$  are combined with the widely known benefits of the PANOS range. Tried-and-tested PANOS technologies such as efficient thermal management combined with the LED mixing chamber and a large variety of reflectors ensure excellent lighting quality. The new range is available in a round (E100/150/200) and a square (Q140/190) version. A choice of three luminous flux packages with 1000 lm, 1800 lm or 2400 lm is available, either with warm (3000 K) or intermediate (4000 K) colour temperature. The clear stylistic idiom and easy installation features continue to impress.

DESIGN Chris Redfern, Sottsass Associati

# 8

## SUPERSYSTEM Modular LED lighting system



Thanks to its minimalist design, SUPERSYSTEM is the ideal solution wherever the luminaire is not supposed to dominate the architecture and interior. Thanks to a number of extensions and consistent implementation of cutting-edge LED technology, SUPERSYSTEM is now able to fulfil complex lighting tasks even more efficiently. Warm white colour temperatures are ideal for creating pleasant, relaxing lighting scenes. Zumtobel now meets the demand with a colour temperature of 2700 K. In addition, the successful mini-downlight is now also available in an extra-slim version: the fixed lighting head is installed flush with the ceiling and is recommended wherever maximum unobtrusiveness is required. In order to allow more freedom of design, an additional section type was introduced: the Height-Extended section. In comparison with the existing H section, it allows more space for cabling and thus facilitates addressing of several different phases. The extended SUPERSYSTEM product range allows for more facets to general lighting as well. Thanks to consistent further development of lighting technology, seamless LED light lines with direct and indirect light distribution can now also be implemented using SUPERSYSTEM. If the lighting task requires a particularly high extent of glare control, a narrow light line with sophisticated lens technology is now available for insertion into the SUPERSYSTEM sections. A linear LED wallwasher has also been added to the portfolio for the "Museum/Art and Culture" application area, which is able to illuminate vertical surfaces in an especially uniform manner thanks to a unique reflector/lens combination.

DESIGN Symetrys

# 9

## FACTOR LED spotlight



Zumtobel has added FACTOR, a modular LED spotlight, to its product range for shops and retail areas. FACTOR combines reduced complexity with great lighting quality and is available in two design versions: its conical and cylindrical housing provides plenty of creative scope for implementing retail lighting solutions. It is installed on a 3-phase track or via METRUM, thus ensuring flexibility: if the shop design needs to be modified, the FACTOR spotlights can easily be repositioned. FACTOR is optionally available in a warm (3000 K), intermediate (4000 K) colour temperature or as TGRfood version to ensure a presentation that matches specific merchandise.

DESIGN EOOS

## 10

**PERLUCE LED**

Linear luminaire with LRO optic



The combination of LED technology and luminance-reducing optic (LRO) is the result of consistent ongoing refinement of the PERLUCE luminaire range. The linear LED luminaire incorporating LRO is now increasingly installed in offices, schools and other educational facilities as well. As it provides uniform illumination and glare-free light for screen work, a high level of flexibility in arranging desks and designing workplaces is ensured. With a luminaire efficiency factor of 90 lm/W, PERLUCE LED also saves costs and reduces CO<sub>2</sub> emissions effectively.

DESIGN Stefan Ambrozus, Studio Ambrozus

## 11

**GRAFT high temperature (HT)**

High-bay LED luminaire for high temperatures



The GRAFT HT high-bay LED luminaire is ideal for installation in working environments featuring high temperatures of up to 55°C. An addition to the existing GRAFT product range, it is the perfect solution for industrial applications in high-bay storage facilities or in manufacturing bays with extremely high temperatures. With a luminous flux of up to 18,000 lm, GRAFT HT provides the light quantities required even at extremely high ambient temperatures. The necessary thermal management is provided by the rib structure of the die-cast aluminium housing. Thanks to the airflow resulting from a stack effect, cooling is ensured and the LEDs' service life is considerably extended, even at high temperatures. At the same time, the accumulation of dust is prevented. This is of particular relevance in areas that are difficult to access and where maintenance intervals are reduced to a minimum. GRAFT HT is able to illuminate long and high rows of shelves as well as spacious halls efficiently and in a targeted manner. Available with two different lens optics – narrow-beam and wide-angle – GRAFT HT provides the right solution for any situation. Each LED has been assigned a separate lens. The light can thus be precisely directed and the glare is controlled very efficiently. With a luminaire efficiency factor of up to 100 lm/W, GRAFT HT offers considerable energy saving potential.

DESIGN Stephen Phillips, Arup

## 12

**CLEAN supreme LED**

Clean-room luminaire



The CLEAN supreme LED clean-room luminaire is now able to make full use of the potential of LED technology. In addition to its high colour rendering index of up to Ra 90, CLEAN supreme LED cannot fail to impress due to the extremely low maintenance requirement and hence reduced service costs. Featuring two luminous flux levels as well as warm and intermediate colour temperatures, this efficient lighting solution is now available for rooms with high hygienic requirements such as laboratories, food production or operating theatres in hospitals. The MPO optic of the CLEAN supreme LED luminaire ensures both perfect lighting quality and glare control.



# 13

## **CLEAN** advanced LED Clean-room luminaire



For application areas where a particularly high colour rendering index is required, Zumtobel now offers the **CLEAN** advanced LED clean-room luminaire also with a colour rendering of Ra 90. This is particularly important in hospitals, laboratories and other highly sensitive industrial areas where there are high demands of hygiene and where there are special lighting requirements. **CLEAN** advanced LED is able to meet this challenge, providing excellent lighting quality thanks to micro-pyramidal optic (MPO) and high colour rendering of Ra 90. Due to the use of LED technology, the maintenance effort is reduced as well.

# 14

## **AXON** Pendant LED luminaire with direct/indirect light distribution



The slim-line **AXON** pendant luminaire is characterised by contemporary architectural design and a large number of functions. Designed for installation in offices and with a cross-section of 38 mm x 38 mm, **AXON** provides excellent lighting quality and a high degree of glare control. This is made possible thanks to the integration of high performance LEDs in combination with the latest generation LED lens technology ensuring perfect direction of light and glare control at the same time. Moreover, a well-balanced coordination of indirect and direct light distribution creates a pleasant atmosphere at the workstation. Various models of **AXON** are available for implementation into sophisticated lighting concepts. Available with a colour temperature of either 3000 K or 4000 K, the lighting can also be configured individually, depending on needs and preferences.

DESIGN Julian Lonsdale, Zumtobel

# 15

## **LINARIA** LED Batten luminaire and light line



With **LINARIA** LED, Zumtobel continues the slim light line's history of success. The combination of purist design with high performance LED modules cannot fail to impress thanks to reliable light that makes no compromises. A special waveguide section is placed across the LED, producing the same beam pattern as the existing **LINARIA** fitted with fluorescent lamps. Thus, the LED points are completely resolved, which results in a uniform appearance without any shadows. Despite the built-in control gear, **LINARIA** LED still boasts the familiar slim-line design, additionally enhanced by an even more simplified installation concept. Available in two different colour temperatures (Ra 80 with 3000 K / Ra 80 with 4000 K) and in three different lengths, the brilliant luminaire flexibly blends into many room scenarios, providing accent lighting and enhancing architectural structures.

## 16

**SFERA**

Free-standing LED luminaire with swarmControl



A research study conducted by Zumtobel shows that more than 66 percent of users work in multi-person offices, where the task area often comprises double workstations. In order to meet these requirements, Zumtobel offers the SFERA free-standing luminaire with a luminous flux of more than 11,500 lm, which is unusually high for LED technology. Innovative technologies support the users in fulfilling their tasks, enhancing their sense of wellbeing in the workplace. When combined with sensControl, the free-standing luminaire is even more intelligent, flexible and efficient. The presence detector automatically switches the luminaire on and switches it off again when the workstation is left unattended. The brightness sensor measures the illuminance level on the desk, dimming the luminaire in accordance with the prevailing light. Thus, sensControl ensures perfect lighting conditions for all those present. Luminaires fitted with additional swarmControl are able to communicate with neighbouring luminaires and help users find their way to the workstation. At the workstation, a cloud of light around a user is created by the interplay of several luminaires featuring swarmControl, resulting in a pleasant working atmosphere and enhancing the user's sense of wellbeing.

DESIGN Julian Lonsdale, Zumtobel

## 17

**DIAMO**

LED downlight and spotlight



Minimum dimensions, maximum effect: Zumtobel extends the DIAMO product range – the LED downlight is now also available as a wallwasher for uniform illumination of surfaces and as a 3-phase spotlight. Its high performance LED modules and reflector technology make DIAMO the perfect partner for high-quality lighting solutions in hotels, shops and offices. Combined with Flood, Wideflood and Very Wideflood reflectors, integral lighting concepts can now be implemented using the wallwasher and the spotlight. Specially designed reflectors ensure high-precision light distribution without any spill light as well as perfect glare control; DIAMO is available with colour temperatures of 2700 K, 3000 K and 4000 K. Whether in the cosy atmosphere of a hotel room or for targeted illumination of a reception area: viewers perceive DIAMO as a minimalist and unobtrusive lighting solution providing excellent lighting quality.

## 18

**ELEVO**

LED spotlight



Two new spotlights add more facets to façade lighting and the presentation of architecture. A linear wallwasher that is available in lengths of 420 mm, 820 mm and 1220 mm, ELEVO Line is perfectly suited for illuminating large façades and surfaces. ELEVO L2 is a small power package. With elliptical, narrow or wide beam angles or as a superspot, the luminaire ensures the targeted direction of light and is able to produce lighting effects that are extremely finely tuned, depending on the lighting task at hand. The flat and compact design of the ELEVO LED spotlight turns it into an inconspicuous integral part of the façade that is invisible to passers-by. The new spotlights are available with colour temperatures of 3200 K and 6000 K, or as RGB luminaire to create colourful and dynamic effects. Just as flexible as ELEVO's application areas are the options to control it: either via a DMX protocol or a USB service tool, or ELEVO II can also be dimmed using a separate PWM control line. The built-in temperature guard ensures a long service life of the IP 66-rated luminaires.

Available from autumn 2014



# 19

## CAPIX evolution LED media façade luminaire



Like a second skin, the CAPIX evolution LED matrix clings to the façade. With immediate effect, the media luminaire offers even more flexibility in the illumination of buildings and objects thanks to two different batwing lenses (140° and 155°). Installation, too, has become easier, requiring only one data line and one supply line, so that it can now be installed virtually anywhere. Each CAPIX pixel incorporates three latest-generation RGB LEDs, which results in a bright and brilliant lighting effect even when viewed from long distances. Upon request, CAPIX evolution is also available in white. In addition to generating colours and other effects, the intelligent control system also allows you to run a sequence of moving pictures. The thermal management integrated in CAPIX evolution protects the luminaires at high temperatures, considerably extending their service life.

Available from autumn 2014

# 20

## Zumtobel MAINTENANCE SERVICES for ONLITE

Maintenance and inspection of emergency lighting systems with separate-battery or central-battery supply



System operators must dispose of emergency lighting that is ready to operate at any time, for the complete emergency lighting system including emergency and escape-sign luminaires must be fully functional in the event of an emergency and in mint condition during inspections by the relevant authorities. A continuously maintained system does not only reduce follow-up costs significantly, but ensures compliance with legal provisions. With Zumtobel MAINTENANCE SERVICES for ONLITE local SB 128 and ONLITE central eBox, CPS and LPS, system operators have a system at their disposal that is perfectly serviced at any time. Zumtobel MAINTENANCE Services for ONLITE are based on annual maintenance and direct contact with Zumtobel experts. The maintenance package is complemented by access to a knowledge database, the Zumtobel service record and special preferential rates for spare parts and training courses as well as optional inspection of the emergency and escape-sign luminaires. Two service models are available depending on specific needs. System operators relying on Zumtobel's MAINTENANCE SERVICES for ONLITE pass on all safety issues to Zumtobel experts and will never have to worry about them again.

# 21

## ONLITE pictographs



Pictographs in compliance with ISO 7010 standard



The new ISO 7010 standard for emergency signs has set the course for uniform escape sign pictographs across national borders. With immediate effect, Zumtobel offers – in addition to the standard pictographs – new pictographs displaying 45° arrows and an arrow pointing upwards. Thus, ONLITE is the first escape sign range on the market to offer a complete product portfolio including all new pictograph versions.

## 22

## Efficiency Upgrade

|   |                  | Luminaire Efficiency   | Wattage                                      |
|---|------------------|--|--|
|     | AERO II          | 101 lm/W <b>+58 %</b>  | 138 W  |
|   | SLOTLIGHT II LED | 87 lm/W <b>+30 %</b><br>91 lm/W <b>+40 %</b><br>90 lm/W <b>+38 %</b><br>72 lm/W <b>+36 %</b><br>76 lm/W <b>+42 %</b><br>75 lm/W <b>+40 %</b> | 10 W<br>19 W<br>24 W<br>10 W<br>19 W<br>24 W |
|   | OPURA            | 105 lm/W <b>+15 %</b>  | 100 W  |
|   | CAPA             | 105 lm/W <b>+15 %</b>  | 100 W  |
|  | TECTON LED       | 112 lm/W <b>+12 %</b>  | 47 W   |
|  | PANOS INFINITY   | 82 lm/W <b>+ 7 %</b><br>91 lm/W <b>+ 9 %</b><br>89 lm/W <b>+10 %</b>   | 14 W<br>21 W<br>29 W                         |
|   | VIVO L           | 70 lm/W <b>+13 %</b>   | 50 W   |
|  | CARDAN LED       | 70 lm/W <b>+13 %</b>   | 50 W   |



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**ZUMTOBEL**



## **The Essence of Light.**

### **SEQUENCE**

This LED luminaire was first developed to exploit the capabilities of modern LED technology to the full: not just in terms of design, but also in respect of its electronic components and control systems. Thanks to the direct/indirect lighting components, intelligent control technology and modular design, SEQUENCE perfectly combines all important aspects – perfect glare control, directional light, optimum lighting quality and individually adjustable lighting scenarios.

**LITECOM**  
ready

[zumtobel.com/sequence](http://zumtobel.com/sequence)

Zumtobel. The Light.