



ZUMTOBEL

# LIGHT FOR OFFICES AND COMMUNICATION



**Light for offices and communication**

Users are at the heart of contemporary office concepts and hence interior design and office lighting. Intelligent lighting solutions help to increase people's sense of well-being, to create identity and at the same time cut costs. Zumtobel is an experienced office lighting expert. Over many years we have amassed extensive knowledge from application and research in the sphere of using light in offices. The consistent further development of our products is based on user studies on the effects of light and on perceived lighting quality. Lighting solutions by Zumtobel create working conditions that make people feel good, thus motivating them and helping them concentrate on doing their job. Lighting scenes that can be adjusted to users' personal preferences by means of variable colour temperature and quantity of light increase employee satisfaction and create identity. High-quality product design and architectural lighting design also play a major role here. Likewise, innovative technologies and control systems can be used to reduce energy and maintenance costs. This is how Zumtobel optimises lighting quality and energy efficiency.

Zumtobel. The Light.

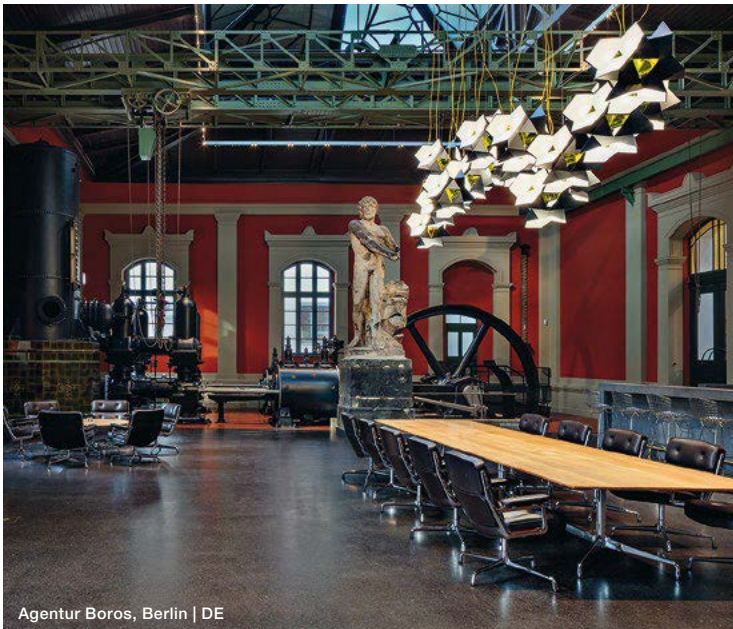
# Applications



Computer Gross, Empoli | IT



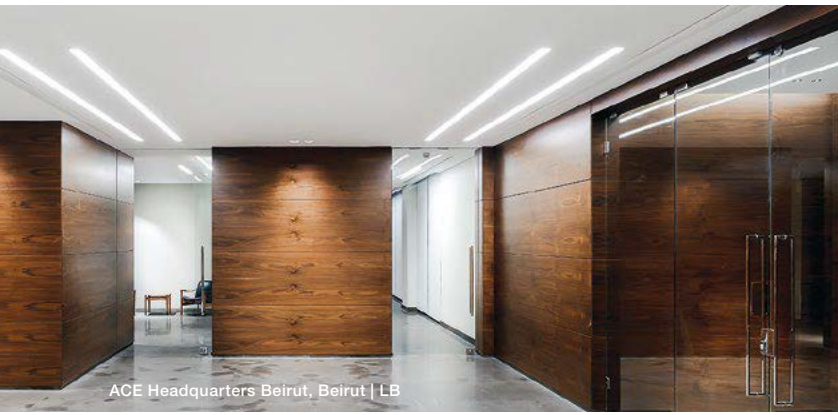
Hertz Autovermietung, Frankfurt | DE



Agentur Boros, Berlin | DE



Symantec, Dubai | AE



ACE Headquarters Beirut, Beirut | LB



Ceramiche Refin S.p.A., Casalgrande | IT



VHV, Hanover | DE



Repsol, Madrid | ES

## References

ACE Headquarters, Beirut, LB / AOK, Berlin, DE / Auto Hrvatska-Gruppe, Zagreb, HR / Baumschlager Eberle, Lustenau, AT / BAWAG, Graz, AT / BFI, Steyr, AT / Blumau Tower, Linz, AT / Boros Agentur, Berlin, DE / City Green Court, Prag, CZ / CMA CGM Tower, Marseille, FR / Credit Suisse, Zurich, CH / CSCS Forschungsbüro, Lugano, CH / DBS Asia Central, Singapore, SG / Debrunner Acifer, Lausanne, CH / Der Standard, Vienna, AT / Deutsche Bank, Frankfurt am Main, DE / e.e.com elektroanlagen ag, Wallisellen, CH / G&O Göberinger Oman Rechtsanwältin, Klagenfurt, AT / Google UK Limited, London, GB / Hama Technics, Volketswil, CH / Huawei Building Complex, Shanghai, CN / Hausbank Munich, DE / Hertz Autovermietung, Frankfurt, DE / Hubert Burda Medien, Munich, DE / i+R Schertler, Lauterach, AT / Illwerke, Schruns, AT / K&L Gates Anwaltskanzlei, London, GB / Käser AG Elektroinstallation, Olten, CH / Lansforsakringar, Stockholm, SE / LifeCycle Tower ONE, Dornbirn, AT / Medientcenter Schladming, DE / Austrian Embassy, Jakarta, ID / pewag International GmbH, Graz, AT / Pfanner Getränke, Lauterach, AT / Plaza 66, Shanghai, CN / Semperit AG Holding, Vienna, AT / swisspro AG, Zurich, CH / Symantec Offices, Dubai, AE / Talk Talk, London, GB / Temporary Visitors Center (TVC), Abu Dhabi, AE / Torre Espacio, Madrid, ES / Viessmann Werke, Zaventem, BE / Villa Flora, Venlo, NL / Vodafone, Milan, IT

**Office building 2226 (facade see cover), Lustenau | AT**

Architects: Baumschlager Eberle, Lustenau | AT

Lighting design: Symetrys, Lustenau | AT

Lighting solution: LINARIA batten luminaire, PANOS infinity LED downlight





<b>Research study</b>	Lighting quality perceived in offices	10
<b>Enhancing people's sense of well-being</b>	Introduction	12
	Visual performance and visual comfort	14
	Biological effects of lighting	16
	Individual adjustment	18
<b>Creating identity</b>	Introduction	20
	High-quality product design	22
	Enhancing architecture	24
	Variable lighting scenes	26
<b>Reducing costs</b>	Introduction	28
	Energy efficiency	30
	Investment and maintenance	32
<b>Energy Performance Check</b>	Study regarding LEED® certification	34
<b>Comparative calculation</b>	LED compared with T16 luminaires and TC-DEL downlights	36
<b>Design examples</b>	Tour of an office building	38
	Team office	40
	Office cubicle	41
	Conference room	42
	Reception	43
	Break-out zone	44
	Corridors	45
	Video conferencing room	46
	Informal communication area	47
<b>Lighting management</b>	LITECOM focuses the light on the user	48
<b>Emergency lighting and emergency lighting systems</b>	ONLITE provide safety from a single source	50

# Research study

## Lighting quality perceived in offices

Lighting competence originates from many years of experience and extensive technological expertise, to which Zumtobel adds scientifically sound, application-based lighting know-how. In close collaboration with international experts and institutions, Zumtobel is a leader in lighting research, constantly pushing ahead with new product innovations.

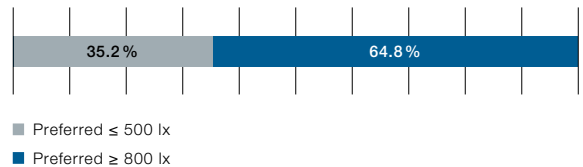


The most recent findings originate from the global user study on lighting quality perceived in offices, which was conducted jointly with the Fraunhofer Institute of Labour Planning and Organisation (IAO). This study focuses on people and their individual lighting needs. A key tool of the study is a multilingual questionnaire that has been used by some 2700 participants from Europe, Asia, Australia and the USA since autumn 2013. Based on the analysis, a world map of light is created that shows lighting quality perceived in offices contrasted with the users' personal preferences. Initial evaluations of the long-term study provide important hints as to which light is best suited to particular individuals in specific situations. These data enable us to effectively improve lighting quality and thereby enhance people's sense of well-being at the office.

### Preferred illuminance level significantly higher than specified in relevant standards

More than 60 per cent of study participants prefer illuminance levels of 800 lux and higher. Accordingly, the great majority wants illuminance levels markedly higher than the 500 lux required by the relevant standards. While differences between the two sexes are minor, the desired illuminance levels show marked variations across the various age groups. Young people up to the age of 35 years, for instance, prove to be particularly "light-hungry".

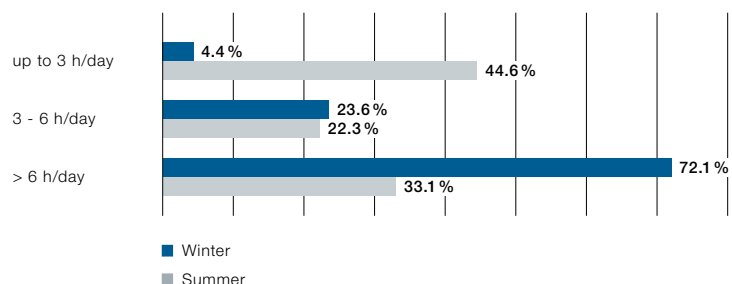
### Preferred brightness according to age group (26–35 years) Interim data analysis Europe [n = 2148]



### High demand for artificial lighting, even in summer

Some 72 per cent of those surveyed use artificial lighting for more than six hours on winter days. For the brighter summer months, some 33 per cent of those surveyed indicated the same number of hours. This demonstrates the high significance of lighting in everyday work and shows how important it is to perfectly match daylight and artificial lighting.

### Power-on time of artificial lighting in winter and summer respectively Interim data analysis Europe [n = 2148]

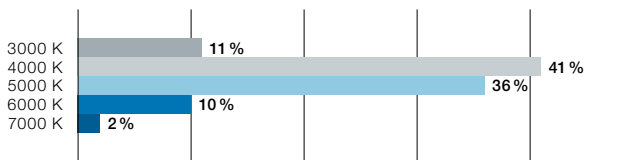


The detailed analysis as well as the findings compiled can be found in the White Paper on the "Lighting quality perceived in offices" research study [zumtobel.com/study-office](http://zumtobel.com/study-office)

**Differing colour temperature preferences**

Intermediate and relatively warm light is generally perceived as more pleasant than cool light. In terms of age or sex, tendencies are much less clear and rather emphasise the generally heterogeneous distribution of colour temperature preferences. In practical terms this means that flexible luminaires with variable colour temperatures should ideally be used.

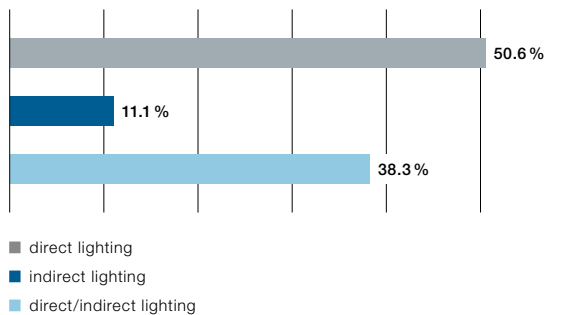
**Preferred colour temperatures**  
Interim data analysis Europe [n = 2148]



**Broad approval of direct/indirect lighting**

The research study reveals that more than 60 per cent of all offices are illuminated with either direct or indirect light exclusively. However, direct lighting is given preference by only 18 per cent of study participants. 82 per cent of study participants would prefer a combined direct/indirect lighting solution to enhance their sense of well-being. At present, only 38 per cent of study participants are allowed to work under such ideal conditions.

**Type of lighting in place (current situation)**  
Interim data analysis Europe [n = 2148]

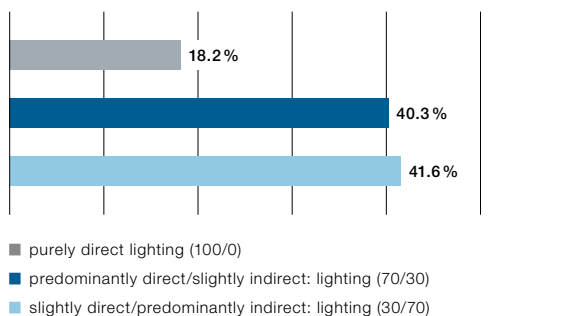


**Controllable lighting increases people's well-being**

In few offices only can the lighting be adjusted to meet the individual needs of the users. 81 per cent of survey participants said that they were having only limited options, or none at all, to control the lighting situation at their workplace. However, the more options they have to adjust the lighting, the more satisfied the employees are and the higher they rate their well-being.

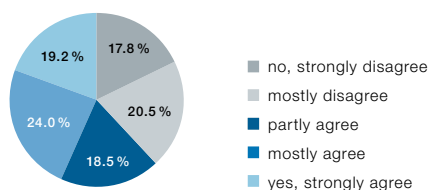
**Preferred type of lighting (target situation)**

Interim data analysis Europe [n = 2148]



**Distribution "I can always set or adjust the visual/lighting situation at my workplace to optimum effect."**

Interim data analysis Europe [n = 2148]





Dr. Ing. Jörg Kelter  
Fraunhofer Institute of Labour Planning and Organisation

"Good visual and lighting conditions help to ensure that employees feel at ease, both physically and mentally. To start with, what is always absolutely necessary is that the lighting does not bother the users. The noble art of truly good lighting solutions is to provide intelligent options for changing or adjusting the lighting and visual situation according to the users' individual needs and to also deliberately address the emotional level of human sensory perception."



**Vodafone Village, Milan | IT**

Architects: Dante O. Benini & Partners Architects, Milan | IT

Lighting design: Dante O. Benini & Partners Architects, Milan | IT



## Enhancing people's sense of well-being

Only happy employees are efficient employees. We encounter a huge variety of different visual stimuli in the course of daily office work. The right lighting is crucial in the process. Light affects almost all vital processes in the human body, and also has an impact on people's performance, health, safety and sense of well-being. For highly motivated and productive people, quality characteristics of light such as light output and changes in colour temperature as well as options of influencing lighting conditions individually are of decisive importance.

# Enhancing people's sense of well-being

## Visual performance and visual comfort

- **People take in 80 per cent of all information via their visual sense**
- **Visual lighting quality is ensured by the quality characteristics of light in line with base levels under applicable standards**
- **In order to provide for optimum vision, the quality characteristics in the lighting concept are evaluated variably, depending on visual task, room utilisation, architecture and individual requirements**

In conjunction with specific visual tasks and people's visual faculty, light is a visual ergonomic parameter. It influences visual performance, which is intended to perform visual tasks even under difficult conditions and for a prolonged period of time. People's sense of well-being is influenced by visual comfort, which helps increase their performance. Last but not least, good lighting quality provides for safety. European Standard EN 12464-1 for lighting of indoor workplaces defines specific implementation in terms of quality and quantity. Illuminance, uniformity and glare control are key photometric parameters to ensure visual performance. Glare may have an impact on the psychological level, too, impairing visual comfort by creating unsatisfactory ambient conditions. Colour rendering enhances proper recognition of visual tasks and people's sense of well-being by meeting expectations like the natural rendering of the skin's colour. Balanced brightness distribution has a positive impact on the eyes' state of adaptation, which is reflected in visual acuity or contrast sensitivity, among other things. Luminance distribution in the room also plays a major role for perception processes and therefore visual comfort. People perceive their environment via differences in luminance; special stimuli catch their attention. Rooms or zones in rooms appear open or closed, dull or stimulating, inviting or unwelcoming. The visual ambience and visual performance are also affected by well-balanced shadows, light colour and appropriate light direction. Taking these quality characteristics into account, faces, objects, materials or surfaces to be treated can be perceived perfectly.

→

The administrative district office was successfully refurbished according to the architects' claim that "not only should old and new building components be sensitively combined, but the quality of work for staff members should be improved and the service character of the office should be made noticeable". Light has played a major role and is now also a key factor in terms of creative design and commercial success. Compared to the former lighting system, energy consumption has been cut by 43 per cent, while lighting quality has been increased at the same time.

### **Administrative District Office, Marktoberdorf | DE**

Architects: Stadtmüller.Burkhardt.Architekten, Kaufbeuren | DE  
Lighting design: Ing.-Büro Körbl + Feneberg GmbH, Füssen | DE  
Lighting solution: SLOTLIGHT light lines, LINARIA individual batten luminaires, CLARIS II pendant luminaires, MICROS LED downlights



# Enhancing people's sense of well-being

## Biological lighting effect



### Stimulation in the morning

Colour temperature: 5000 K

$E_h^*$  (daylight and artificial lighting): more than 500 lx

Aim: synchronisation of people's circadian rhythm, complete suppression of melatonin release



### During the day at sunshine

Colour temperature: 4000 K

$E_h^*$  (daylight and artificial lighting): more than 1000 lx

Aim: enhancing well-being through well-matched colour temperature, accordingly warmer light colours during sunshine



\*  $E_h$  = horizontal illuminance

DIN SPEC 67600:2013-04 provides for design reliability and includes specific application recommendations for integral lighting concepts with biological effects

- **During the dark winter months, no daylight is available in indoor areas to synchronise people's circadian rhythm**
- **Adding biologically effective artificial lighting to incident daylight is recommended for offices in particular**
- **Biologically effective artificial lighting solutions, based on daylight, stabilise people's circadian rhythm**

For the first time, DIN SPEC 67600:2013-04 includes specific design recommendations for biologically effective lighting, bringing together technological options and current research findings. The solution approach shown here is based on the simulation of daylight: depending on the season, geographical location, weather situation and the position of the workstations in a room, there is not always sufficient daylight available in indoor areas to synchronise people's circadian rhythm. In this case, biologically effective artificial lighting solutions are the key to stimulate activity during the day and ensure a sound sleep at night. For purposes of lighting design, not the traditional illuminance level in the task area is decisive, but spectral distribution and vertical illuminance at eye level, which have an impact on people, among other factors (see table). Apart from biological effectiveness, emotional lighting effects also play an important role. Clearly bluish light colours, for instance, may create a stabilising and stimulating emotional effect at the right moment, but may not be accepted when the sun shines, as various studies have shown. The aim is to harmonise the visual, emotional and biological effects of light.





**During the day with cloudy sky**

Colour temperature: 6000 K  
 E<sub>n</sub>\* (daylight and artificial lighting): more than 800 lx

Aim: enhancing well-being through well-matched colour temperature, accordingly cooler light colours with overcast sky



**Getting ready for sleep**

Colour temperature: 3000 K  
 E<sub>n</sub>\* (daylight and artificial lighting): more than 500 lx

Aim: synchronisation of the circadian rhythm, no interference with melatonin release, restful sleep



To a large extent, biologically effective lighting concepts meet the requirements of the participants in the Fraunhofer study on lighting quality, which focuses on feel-good factors. Most of the participants want illuminance levels in excess of 800 lux, around 50% prefer lighting colours of 5000 K and above. One third of study participants have the light switched on for more than six hours a day, even during the summer months. From this, two starting points are derived for discussing emotional and biological lighting effects. First, at many workstations, e.g. in the room depth of open plan or team offices, too little biologically effective light is available. A second, rather emotional, issue is people's need to use artificial lighting to compensate for the lack of windows next to their workstation. This enhances self-fulfilment and well-being. No matter whether illuminance and colour temperature work in sync with daylight or trigger phases of stimulation – what enhances people's well-being is the option to personally control their lighting environment, which, according to the Fraunhofer study, is not fully available to 80 per cent of those surveyed.

Extract from *DIN SPEC 67600:2013-04*

<b>More intense biological effects of light are produced by</b>	<b>Less intense biological effects of light are produced by</b>
Higher illuminance	Lower illuminance
Longer duration of exposure	Shorter duration of exposure
Higher level of blue components	Lower level of blue components
Wide-area lighting	Pinpoint lighting
Dynamic lighting changes	Constant light
Lower level of radiation before the light exposure under review**	
Morning light is most effective for synchronising the body clock	Light in the afternoon affects the body clock to a relatively low extent

\*\* Persons who were adapted to darkness for an extended period before being exposed to light will be more sensitive to light and show a stronger response

# Enhancing people's sense of well-being

## Personal control

- **Modern lighting and room concepts meet people's individual requirements when performing various tasks**
- **Each individual prefers a different luminous color and illuminance level**
- **Innovative control concepts directly at the workstation as well as small, logically assigned luminaire groups are required in technical terms to allow for customisation and achieve energy savings**

Employees' tasks are becoming increasingly varied, and purely desk-based work is often mixed with creative, communicative tasks. The function of lighting is to also assist individual activities such as concentrated and communicative work, for instance. Rather than uniform general lighting, modern working environments favour a lighting concept that divides space up into zones and, by doing so, caters for various types of use and the needs of individual employees. Each employee is enabled to individually adjust the brightness and colour temperature assigned to him/her. Both employees and their company benefit from a lighting management system that not only makes it possible to configure individual lighting situations but encourages people to do so thanks to intuitive operation. Modern control points that simplify interaction between the user and the building are visible features of intelligent lighting control. Zumtobel has gathered valuable findings on personally ideal lighting situations from the global user study on lighting quality perceived in offices, which was compiled in collaboration with the Fraunhofer Institute and is collecting data on an ongoing basis.



- ↓ The "smart working concept" implemented for Credit Suisse's 21,000 staff members is not only associated with the concentration and re-arrangement of workstations, but rather with an increase in their attractiveness. The integral development approach takes factors such as demographic changes, social diversity and the demand for flexible job models into account. The SFERA free-standing LED luminaire has been especially designed to adjust to the individual employees' needs, allowing them direct influence to ensure maximum ergonomic compatibility and lighting quality at their place of work.

**Credit Suisse AG, Zurich | CH**

Architects: Stuecheli-Architekten AG, Zurich | CH

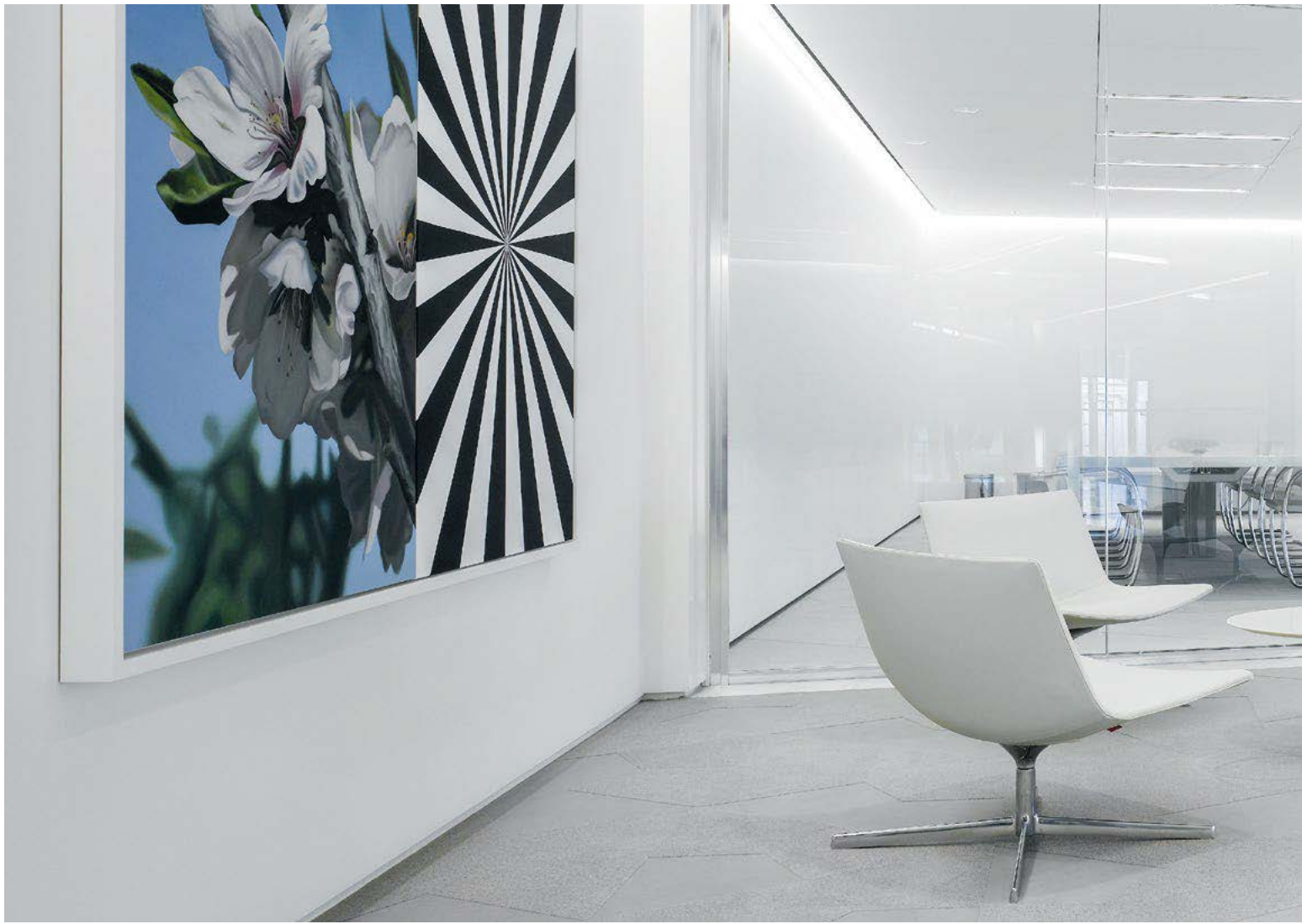
Lighting design: Reflexion AG, Zurich | CH

Interior design: Greutmann bolzern design studio, Zurich | CH

Smart working concept/pilot area: Congena GmbH, Munich | DE, Camenzind Evolution Ltd., Zurich | CH

Lighting solution: SFERA free-standing LED luminaire featuring SwarmControl technology





Prof. Dietmar Eberle  
Baumschlager Eberle architects

“Light – dark, warm – cold, red – green. Measuring, calculating, controlling, sensing, experiencing, feeling. There is not only the One; there is duality. The challenge is to make relations and principles of operation clear. And so, as we get very close to reaching this goal every time, we are just as far away from it at the same time. Light is energy, and energy is heat. In terms of energy, dealing with light will become the most important issue at the office of the future.”

**K&L Gates, London | GB**

Client: Land Securities, London | GB

Architects: LSM, Washington | US

Lighting design: Seider Lighting Design, Berlin | DE

**Creating identity**

When it comes to identification with a cause or an enterprise, a strong mission statement or symbol is of vital importance. Architecture is one of the most catchy symbols. If a company wants to make sure that it will not lose anything of its power (of identification), it also has to focus on its employees' well-being. This need is as individual as the employees are themselves. Only people who feel supported in their work to optimum effect will identify with their employer. Design aspects, options for adjustment by individual staff members and well-balanced environmental conditions are the most important factors of influence.

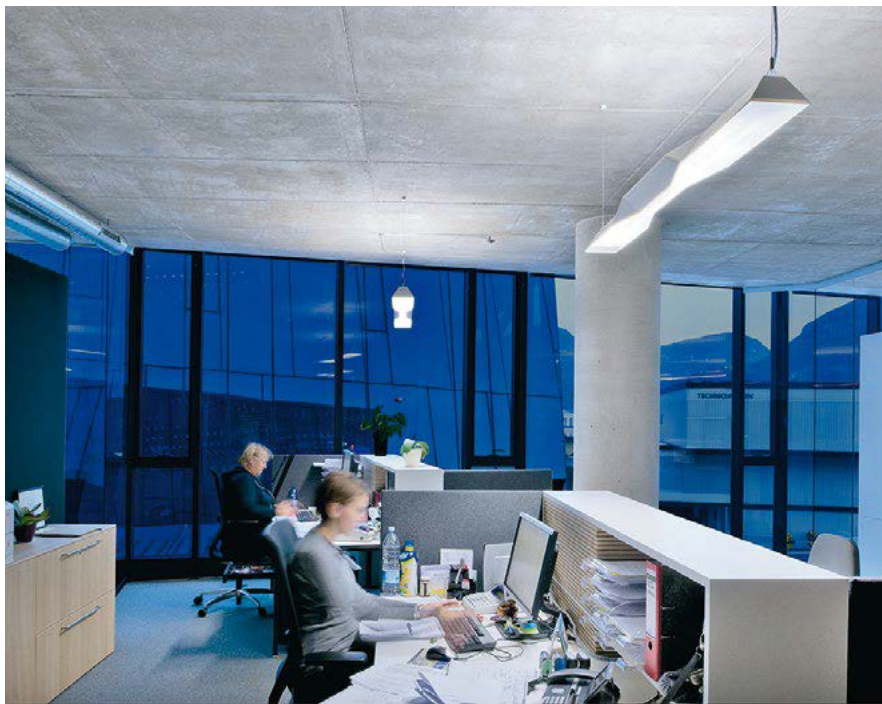
# Creating identity

High-quality product design

- **Essential factors are the look and materials of the luminaire as well as the interaction with architecture and daylight**
- **Top-level product development also includes robustness, long service life, easy installation and maintenance, user friendliness as well as environmental aspects**
- **Simplicity is the key to high user acceptance of luminaire and lighting management**

High-grade product design manifests itself in the options for creative design offered by a luminaire. These may lie in the object itself through attractive shapes, excellent quality of materials or visibly presented technology. The second aspect is the room atmosphere that a luminaire creates within the architectural context - in line with the overall lighting design concept, the utilisation of the room and incident daylight. Modelling takes place through bright and dark surfaces, the luminaire is part of the architecture. Perceptible luminance levels can be created directly at the luminaire planes or indirectly via luminous architectural components.

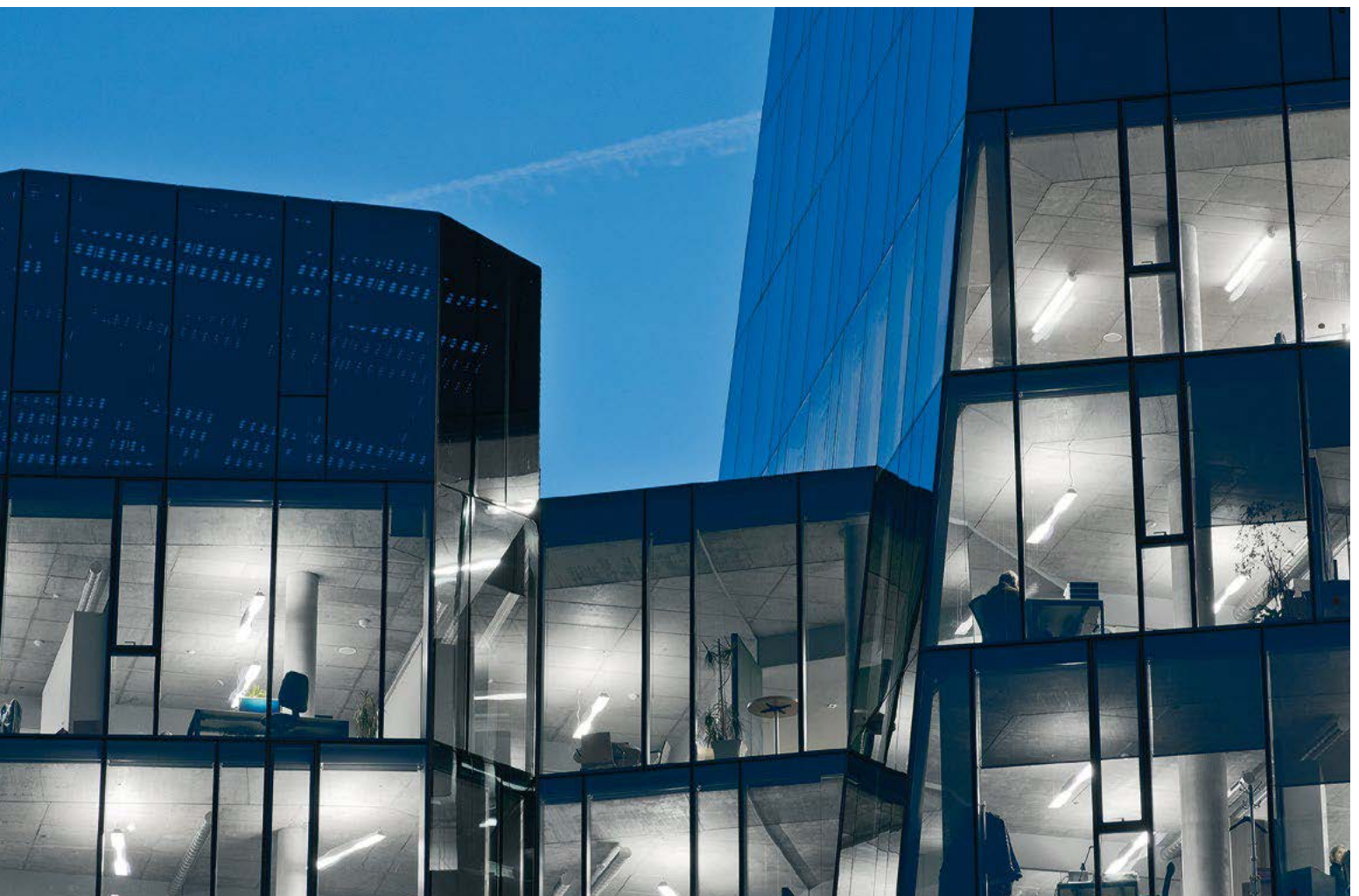
In product development, environmental aspects play an important role. Zumtobel takes care of a proper life-cycle assessment for the entire product life cycle - from resource-saving use of materials through to the possibility of recycling. Utmost energy efficiency is achieved through integration of a lighting management system that focuses on people and their needs. The demand for simplicity results in user-centred design that takes into account scientific findings about human perception as well as ergonomic aspects.



## **Salewa International Headquarters, Bolzano | IT**

Architects: Cino Zucchi Architetti and Park Associati, Milano | IT  
Electrical consultants: Energytech, P.I. Gabriele Frasnelli, Bolzano | IT  
Lighting solution: IBLA special office luminaire, MELLOW LIGHT IV recessed luminaire, SLOTLIGHT II light line, TECTON Slimline continuous-row lighting system, LINARIA batten luminaire, PERLUCE recessed luminaire, LIVIANO spotlight, ONDARIA circular luminaire, ONLITE CPS emergency lighting system, PURESIGN escape sign luminaire, RESCLITE LED emergency lighting

- ↓ "Everything for the Mountains" is the slogan of the European market leader in high-tech alpine clothing. Even the location of the new corporate headquarters of Salewa reflects this motto: Bolzano. The lighting solution for the South Tyrolean model company is part of the eye-catching corporate design. In addition, the building boasts an integral energy and lighting approach that was distinguished within the scope of the renowned "Climate House" concept; some parts of the building even achieved the highest, the golden level of environmental certification.



- **Lighting solutions designed on the basis of an integral approach reflect the architecture and corporate values**
- **Luminaires are tangible items in a room, creating effects in particular by producing direct and indirect luminance levels**
- **By means of luminance levels, the arrangement of luminaires and by taking human patterns of perception into account, architectural objectives such as linearity, zoning and accents are achieved**
- **Light can guide people, invite them to stay or encourage communication**

Light significantly enhances and enlivens the architecture. To this end, lighting design has to deal with people and come to grips with concepts of use and structural situations. Flexible use of rooms, and future viability are achieved by positioning luminaires flexibly. The luminaire design and its physical effects are only one aspect of the architectural concept. A luminaire unit may appear inconspicuous, as an integral part of architecture, or emerge as a very striking feature. Luminance levels make their presence felt much more strongly, as they have an impact on how a room is perceived. In this context, the right light colour may produce beneficial effects, matched to the respective activities and room surfaces. In this way, work environments that appear open or closed, private or public, safe or unsafe are created. In order to create identity using light, places with a unique feel need to be created that dovetail with the people and companies inhabiting them.





- ↓ An easygoing type of contemporary working space has been created at Google's new office premises. No long corridors, no boring open-plan offices or austere conference rooms; instead you find lively colours, stylish yet functional furniture and a splendid lighting ambience. For the offices of the search engine giant, the London-based Penson architects' studio has developed a very unorthodox concept incorporating a combination of shrewd functions and really smart and fresh-thinking workplace strategies. The requirements placed on the lighting concept were defined by architectural structures and the users' needs.

**Google Headquarters, London | GB**

Architects: Penson, London | GB

Interior design and photo: Penson, Anna Pizzey, London | GB

Electrical installations: Elite Electrical, London | GB

Lighting solution: SCONFINE SFERA pendant luminaire, SLOTLIGHT light line, PANOS infinity LED downlight

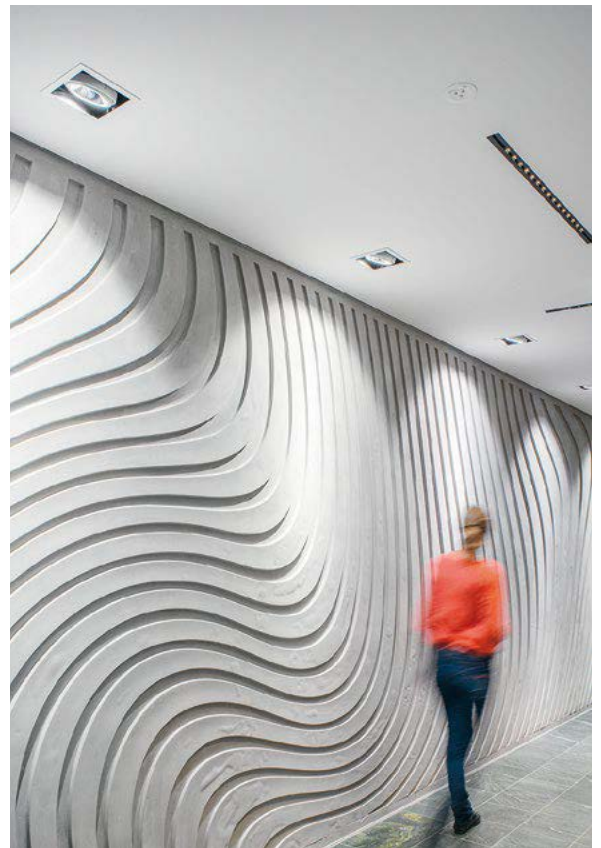


# Creating identity

## Variable lighting scenes

- **Different lighting scenes cater for the individuality of people and their tasks**
- **Selectable lighting scenes lead to high acceptance of the lighting concept**
- **LED lighting solutions with tunableWhite technology allow for the possibility to adjust light colours to natural changes of daylight or to the architecture**
- **Daylight-based control, presence detection and time entries increase the potential for comfort and energy savings**

Lighting management systems are the basis for reconciling the lighting design concept with people's individual needs, with different tasks, with daylight, and with the time of day or the weather situation. Adjustment takes place through static or dynamic lighting scenes that can be selected manually or automatically. For the definition of lighting scenes, different luminaires are put together in ever new modular combinations: thus, concentrated screen-based work in a team office is supported by traditional office lighting and anti-glare blinds. On the other hand, carefully designed lighting in conference zones and an open view to the outside meet communicative and creative requirements. Through dynamically defined lighting sequences, even areas without daylight are provided with a stimulating atmosphere. In this area, LED technology has drastically extended the technological options. tunableWhite luminaires allow for the continuous adjustment of light colours and light quantity at the right time. For the purpose of using buildings flexibly, lighting scenes can quickly be regrouped and adjusted in case of re-arrangement of teams or room definitions. Automatic features such as daylight-based control, presence detection and time entries are frequently used to reduce energy consumption. It is equally important to take into account people's individuality and tasks when designing the various lighting scenes. Accordingly, the personal selection of lighting scenes allows for user-focused lighting management with utmost acceptance, as stipulated by the global Fraunhofer study "Lighting Quality Perceived in Offices". Addressing topics such as individuality, innovation and sustainability reflects corporate values. In this way, light may become a factor influencing a company's identity.



### **Vorarlberger Illwerke AG, Bregenz | AT**

Architects: Hermann Kaufmann ZT GmbH, Schwarzach | AT

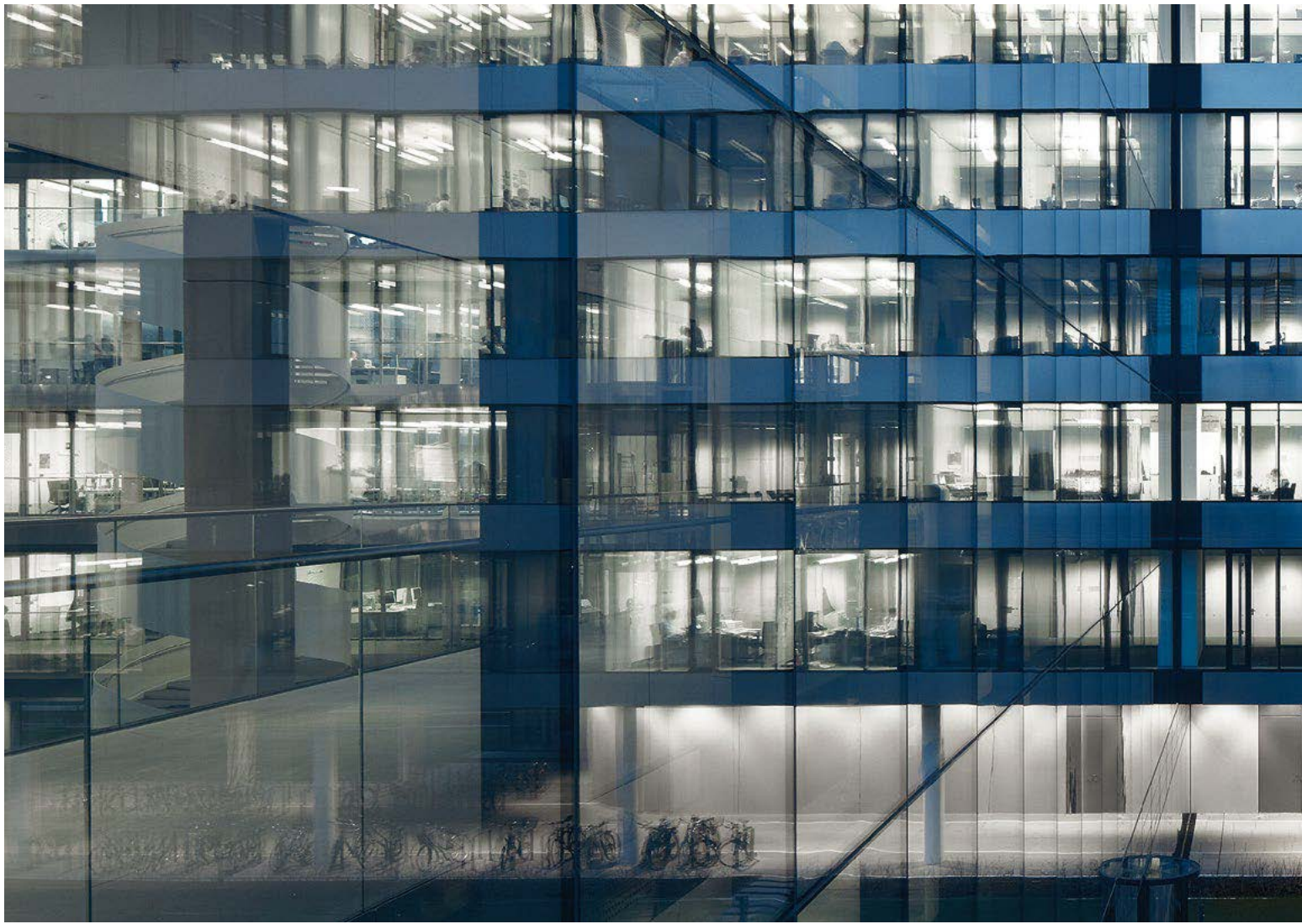
Lighting design: Manfred Remm, Dornbirn | AT

Electrical consultants: elPlan Elmar Lingg, Schoppernaut | AT

Lighting solution: customised wide-area LED luminaire, SLOTLIGHT LED light line, MICROTOOLS LED lighting system, SUPERSYSTEM LED lighting system as special solution, TECTON continuous-row lighting system, CARDAN LED spotlight system, SCUBA moisture-proof luminaire, PERLUCE luminaire, PANOS LED downlight in special colour, FD 1000 LED downlight

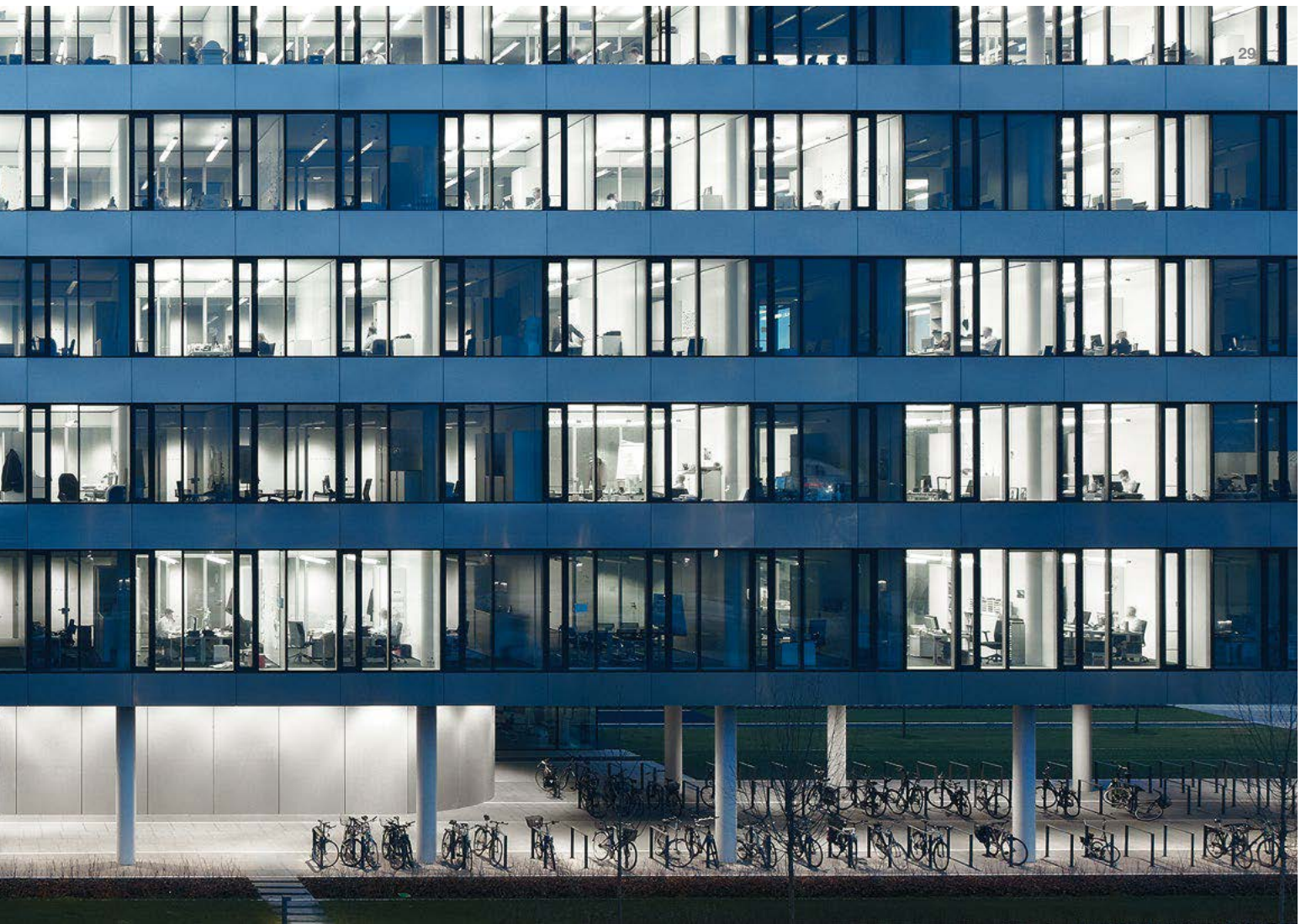


- † With some 10,000 square meters of useful area, the five-storey hydropower competence center of Vorarlberger Illwerke AG is one of the world's largest office buildings built in a timber hybrid building technique. The lighting of the building, which was awarded ÖGNI Gold certification, essentially consists in customised LED light lines. All workstations are positioned along the spacious window surfaces and accordingly provide for a perfect combination of daylight and artificial light. The luminaires, which in spite of their flush fitting appearance are surface-mounted, provide uniform glare-free light at the workplace - even if workstation arrangement will be changed in future - all luminaires are connected to daylight sensors and presence detectors.



Dr. Ing. Heinrich Post  
Consulting engineers for building climate and energy schemes

"In conventional artificial lighting design in Western Europe, due to legally prescribed higher lighting standards, the light output produced will frequently even be higher than the light output required under the LEED® ASHRAE standard. In this case, the traditional process was to reduce optimisation of other service installations, which however did not provide for satisfactory energy efficiency. The use of LED luminaires and a daylight-based control system can compensate this drawback."



**HDI Gerling AG, Hanover | DE**

Architects: ingenhoven architects, Düsseldorf | DE

Lighting design: Tropp Lighting Design GmbH, Weilheim | DE

Electrical consultants: ZWP Ingenieur-AG, Cologne | DE



## Reducing costs

Through energy efficiency, a long service life and lighting management systems, lighting solutions have a direct impact on operating costs. However, cost efficiency should not be at the expense of the employees. They are the key factor of success of any company. Staff costs are a multiple of the building costs.

# Reducing costs

## Energy efficiency

- **Light makes a significant contribution towards the energy efficiency of a building**
- **By fulfilling human needs and taking into account economic aspects, valuable credits for the environmental certification of a building can be collected**
- **Intelligent control systems divide space up into various daylight zones in order to optimise energy efficiency**

In well-balanced lighting solutions, lighting quality and environmental responsibility meet at the highest level. Sustainability studies show that the highest CO<sub>2</sub> consumption by far takes place during operation. Accordingly, luminaires that use innovative (LED) technology to produce light, reduce glare and distribute the light are the cornerstone of environmentally sound lighting concepts, together with lighting management systems. Perfection is achieved by lighting solutions through natural light and its perfect lighting quality: it is biologically effective, changes in line with the rhythm of nature, provides high lighting intensity levels, and is available free of charge for many hours of the day. Professional lighting management is the simplest and most effective way of using daylight to optimum extent. If an office is split up into various daylight zones, the system operates at maximum efficiency without restricting the users' individual configuration choices. User-friendly interfaces and small groups of luminaires with appropriately allocated responsibilities ensure that adjustment according to individual preferences is possible. For in any automated system, a person acting in an environmentally responsible manner is demonstrably a crucial factor when it comes to using light efficiently.

→

The Al Bahar Towers are the latest addition to the Abu Dhabi cityscape. For the two cylindrical towers, Aedas Architects in collaboration with the Arup engineering studio have developed an innovation customised to extremely hot and sunny climatic conditions. The façade inspired by traditional Arabian architecture provides thermal protection while allowing for optimum use of solar energy. All measures combined help to reduce the CO<sub>2</sub> emissions produced by the Al Bahar Towers, built according to the LEED® standard, by 40%. Not only does Zumtobel's lighting solution support the resource-saving concept, but it also complies with the requirements placed on a state-of-the-art office lighting system while highlighting architectural structures.



## Reducing costs

Investment and maintenance



←

On account of its resource-saving construction, the new building of the LVM insurance company has won the North Rhine-Westphalia award for architecture, residential construction and urban development in the category "Energy-efficient building for the future". The focal point of the concept was to combine daylight and artificial lighting in a feasible manner. This is made possible by intelligent LUXMATE LITENET software: all luminaires and blinds are controlled by this lighting management system. Artificial lighting that is adjusted to the natural lighting conditions allows for energy savings of as much as 60 per cent while providing perfect lighting quality.



### **LVM Landwirtschaftlicher Versicherungsverein, Münster | DE**

Architects: Duk-Kyu Ryang/HPP, Düsseldorf | DE

Lighting design: Rhein Licht, Düsseldorf | DE

Lighting solution: modified FREELINE pendant luminaire, LUXMATE LITENET lighting management system, COPA high-bay reflector luminaire, PANOS downlight, CHIARO diffuser luminaire, PERLUCE moisture-proof luminaire



- **The renovation of obsolete lighting solutions saves energy and maintenance costs**
- **The higher cost of investing in an LED solution is quickly compensated by lower operating costs**
- **This investment pays for itself quickly, especially if combined with a lighting control system**
- **The most profitable investment is into satisfied employees, they are the biggest cost factor**

New luminaire technologies have an impact on maintenance and investment. Innovative LED lighting solutions offer an opportunity to combine maximum energy efficiency and lighting quality. Another benefit: LED luminaires are generally dimmable, thus offering greater flexibility for higher lighting comfort and lower energy consumption. Sustainably economic decisions primarily focus on the entire life cycle of a luminaire, not just on investment costs. This is particularly obvious in the long-term savings potential, when dynamic factors such as increasing electricity rates and all maintenance processes are taken into account that are necessary to comply with lighting quality requirements. Modern, efficient lighting solutions need not be confined to new buildings. Far from it: many buildings are being renovated today in order to cope with the growing sense of responsibility towards employees and energy resources.

The renovation of lighting installations offers an opportunity to switch to efficient technologies and at the same time implement modern lighting concepts. In this way it is possible to boost lighting quality, improve employee attitude and make the employer appear more attractive. This increase in quality plus lower maintenance and operating costs add to the value of a property. The benefits of refurbishing lighting can be leveraged by using lighting control. The higher investment costs this entails are amortised within a short period thanks to reduced energy consumption.



New generations of LED luminaires such as MIREL evolution keep the cost of investment for refurbishment and new projects low: they are convincing due to an attractive price/performance ratio, through short installation times and reduced staff effort. Thanks to the simple exchange of luminaires, no additional effort is required for the refurbishment of ceilings. Additionally, LED solutions with a long service life minimise maintenance effort. Considering all these aspects and the greatly reduced energy costs, short pay-back periods are achieved together with increased lighting quality.

# Energy Performance Check

## Study regarding LEED® certification

Sustainable building is an active contribution to saving resources and to establishing a basis of existence for future generations. In this context, the massively growing number of environmentally certified buildings shows that this trend will leave a clear mark on the international building sector in future. The distinction as a green building comes with many benefits in economic and social terms: from higher rental income and selling prices as well as markedly reduced operating and energy costs through to improved well-being and higher productivity of employees.



Environmental certification systems seek to make comparable the impact of buildings on the environment, on society and economy. However, in defining the relevant criteria, the various institutions apply different priorities. With the Energy Performance Check, Zumtobel intends to find out what contribution an energy-efficient lighting solution can make during certification. As a concrete example, one building certification was scientifically analysed according to the American LEED® (Leadership in Energy and Environmental Design) certification system. For a detailed analysis, the item "optimisation of energy efficiency" (EA p2/EA c1) was analysed in detail under the LEED® 2009 for *New Construction* and *Major Renovation* assessment system. This is the certification criterion for which the factor of light may bring up to 19 of 35 credits.

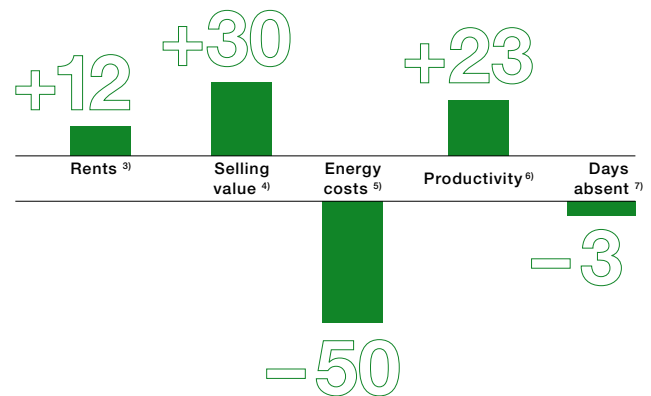
For the energy simulation with exact comparative calculations, Zumtobel has modelled a six-storey reference building, equipped with a lighting solution according to the American ASHRAE 90.1-2007 standard. In order to show how lighting systems that comply with European standards are rated under the LEED® certification system, London was defined as the location. The model was prepared using two different LED lighting solutions by Zumtobel according to DIN EN 12464-1. Both Zumtobel lighting solutions were equipped once with and once without daylight-based control and blinds in each case.

### Up to 5 LEED® credits for the lighting solutions by Zumtobel

A reduction of lighting costs by 74 per cent corresponds to a reduction of overall energy costs by 22 per cent. For LEED® certification, cost savings of at least 10 per cent must be evidenced. All savings beyond that are rewarded with one LEED® credit for every 2 per cent of savings. Accordingly, this results in 5 LEED® credits each for both Zumtobel versions with daylight-based control.

### Additional LEED® credit through environmental product declaration EPD

Apart from the traditional certification criteria, innovative companies, in particular, get a chance to collect additional credits for MR pilot criteria. Zumtobel makes use of this chance by providing EPD environmental product declarations, among other things. This evidence, which is available for all Zumtobel products, provides a detailed list of all traces left by a product in the environment over its entire life cycle.



Detailed information regarding energy simulation and Zumtobel lighting solutions can be found in the LEED® LIGHT GUIDE at [zumtobel.com/greenbuilding](http://zumtobel.com/greenbuilding)

Source:

<sup>3)-6)</sup> The Business Case for Green Building, World Green Building Council, 2013

<sup>7)</sup> Green Buildings and Productivity, CBRE Richard Ellis and USD University of San Diego, 2009

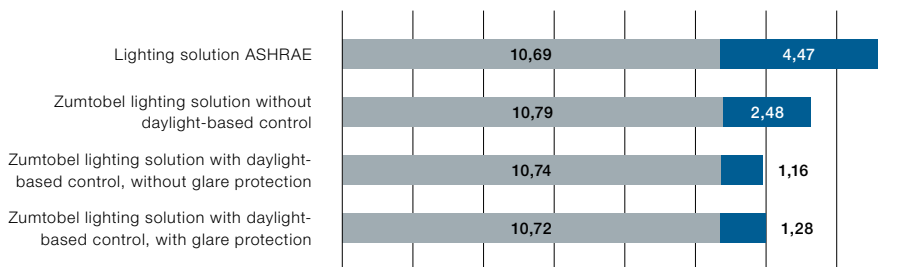


**Reduction of lighting costs by 74 per cent**

For the lighting solution according to the ASHRAE standard, the calculation for the reference model results in total energy costs of approx. EUR 15 per m<sup>2</sup>/a, of which as much as EUR 4.47 per m<sup>2</sup>/a are accounted for by the lighting alone. Using LED lighting solutions by Zumtobel, the share of lighting costs is reduced by some 56 per cent. Combined with daylight-based control, these costs are reduced by further 26 to 32 per cent. The influence of effective glare protection is around 3 per cent.

The overall goal of the Energy Performance Check was to optimise the energy efficiency of a model office building by using various LED lighting solutions within the internationally renowned certification system LEED®.

**Energy and lighting costs compared**



■ Energy costs / service installations in EUR per m<sup>2</sup>/a  
 ■ Lighting costs in EUR per m<sup>2</sup>/a

*Electricity costs: 15 cents/kWh assumed*

Zumtobel lighting solution: LIGHT FIELDS evolution pendant luminaire, SLOTLIGHT II recessed luminaires, PANOS infinity, LIGHT FIELDS evolution mini and MELLOW LIGHT V, CIELOS surface-mounted luminaire

# Quality and efficiency in team offices

## LED compared with T16 luminaires and TC-DEL downlights



SEQUENCE infinity  
LED pendant luminaire



SLOTLIGHT II LED  
light line

SEQUENCE takes light to a new dimension of individuality, combined with high energy efficiency of 100 lm/W. The architecture is emphasised through the svelte luminaire design and additional illumination of walls. The staff's sense of well-being is enhanced by an open-plan room ambience and a pleasant working environment. The new generation of office luminaires with 14 LED modules that can be controlled separately offers customised settings for a variety of user requirements and changing work methods. In order to keep up the team spirit without compromising individuality, the luminaires with their uniform vertical illuminance levels are controlled via the LITECOM lighting management system. Dynamic lighting scenarios create added emotional value while saving energy.

### Underlying conditions

#### T16 luminaires

24 pendant luminaires 2 x 49 W T16  
Luminous flux of luminaire: 7783 lm  
Luminous efficiency of luminaire: 73 lm/W  
18 downlights 1 x 26 W TC-DEL (918 lm / 32 lm/W)

#### LED luminaires

12 SEQUENCE infinity 105 W  
Luminous flux of luminaire: 9650 lm  
Luminous efficiency of luminaire: 92 lm/W  
29 SLOTLIGHT II LED 19 W (wall illumination, 1730 lm / 91 lm/W)

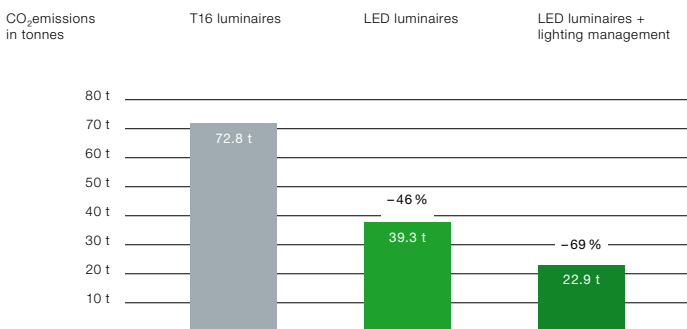
#### LITECOM lighting management system

Energy savings thanks to daylight-based and presence-based control, blinds control and time-based management [zumtobel.com/litecom](http://zumtobel.com/litecom)

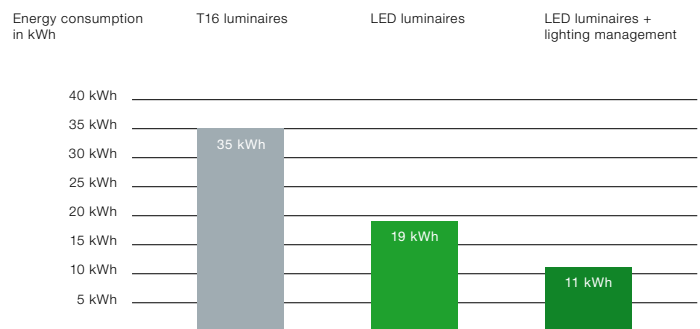
#### Calculation period

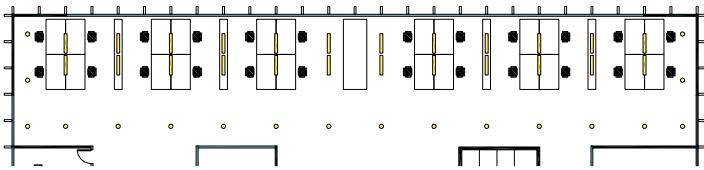
20 years

### CO<sub>2</sub> emissions over life cycle (20 years)

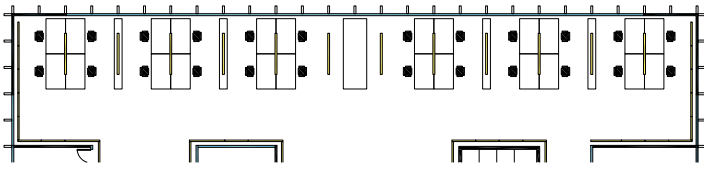


### Average energy consumption per m<sup>2</sup> and year





Team office before



Team office after



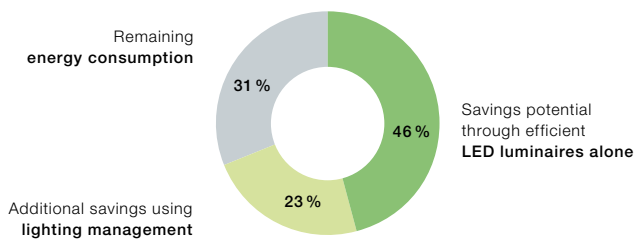
**Enhancing people's sense of well-being**  
The unique versatility of the SEQUENCE beam pattern as well as high contrast rendition form a future-proof basis for manifold tasks.



**Creating identity**  
The slim-line SEQUENCE luminaire with soft transition of light is highly innovative. Through SLOTLIGHT light lines, the zones of the room are given additional structure.



**Reducing costs**  
The efficient LED pendant luminaire only consumes 85 lm/W. Precise lens optic, daylight-based and blinds control, presence and time-based management reduce energy consumption.



- T16 luminaires
- LED luminaires
- LED luminaires + lighting management

ecocalc

The comparative calculation was made using ecoCALC. [zumtobel.com/ecocalc](http://zumtobel.com/ecocalc)

## Design examples

### Tour of an office building

The requirements made on office lighting are manifold; there are, however, numerous standard situations - from meetings via desk work through to the well-deserved coffee break. For eight of these main applications, Zumtobel has designed LED lighting solutions compliant with the respective use. The focus is on three relevant criteria: employees' well-being, corporate identity, and reasonable reduction of energy, maintenance and investment costs.



#### Enhancing people's sense of well-being

The well-being criterion is assessed in line with parameters that have a direct impact on the physical and mental constitution of employees. This includes uniform illumination of the task area, friendly faces as well as bright walls and ceilings to achieve a more spacious and more pleasant room ambience.



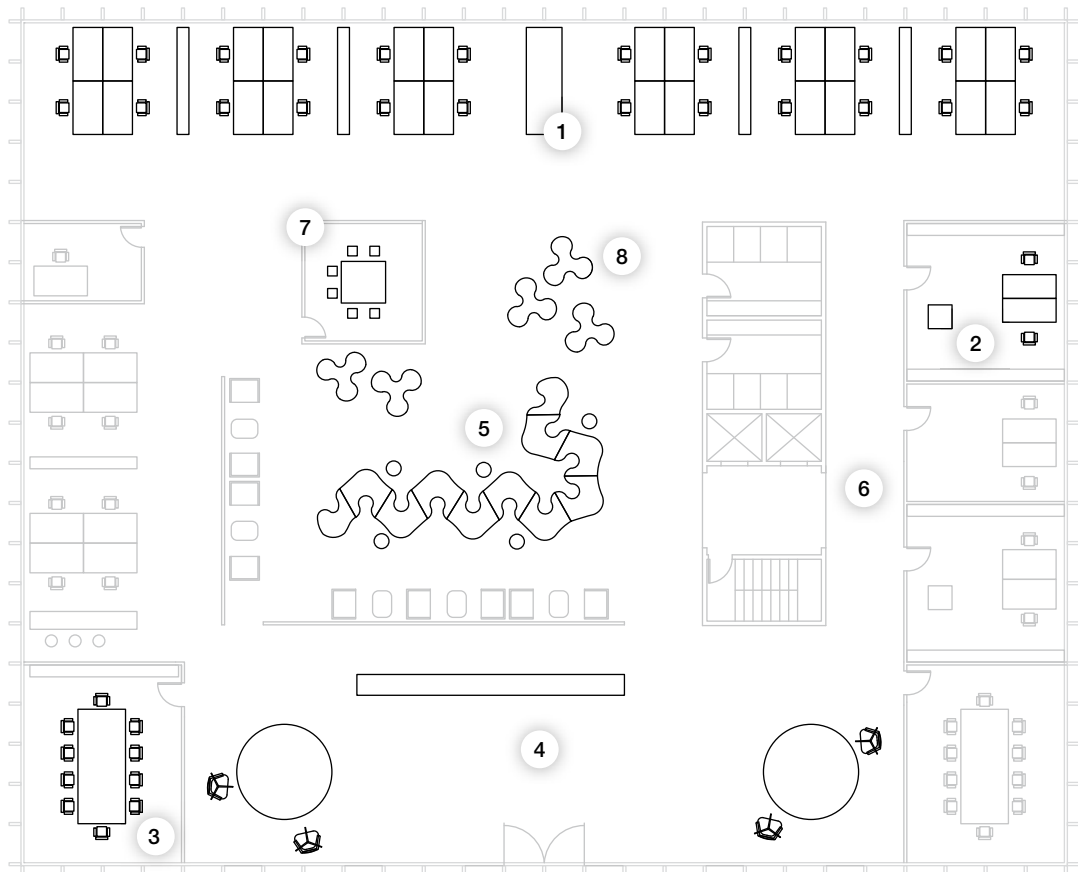
#### Creating identity

Individual well-being is also promoted by the identity parameter. The selected planning examples illustrate the various options. Identity is created through lighting control, integration into the architecture and the aesthetic value of the luminaires.



#### Reducing costs

With a view to a sustainably efficient solution, it pays to not only invest in energy efficient luminaires, but also in well-thought-out lighting control systems. Marked savings in energy and maintenance costs result in quick amortisation and real profit in subsequent years.



### Design tips

The following lighting solutions for eight typical applications in office buildings are all compliant with the DIN EN 12464-1 "Standard-compliant Design Notes". Criteria such as illuminance at the workplace, glare, uniformity and colour rendering are examined in greater detail.

Application	$\bar{E}_m/lx$ (illuminance)	UGR <sub>L</sub> (glare)	U <sub>O</sub> (uniformity)	R <sub>a</sub> (colour rendering)
1 Team office	500	19	0.60	80
2 Office cubicle	500	19	0.60	80
3 Meeting room	500	19	0.60	80
4 Reception	300	22	0.60	80
5 Break-out zone	200	22	0.40	80
6 Corridors	100	28	0.40	40
7 Video conference rooms	500	19	0.60	80
8 Informal communication zones	200	22	0.40	80



**MIREL evolution**  
recessed LED luminaire



**LITECOM**  
lighting management system



- ♥ The perfectly glare-free MIREL LED office luminaire features convincing uniformity and offers sufficient reserves to achieve the lighting level exceeding the standard that is frequently demanded by employees.
- 👉 The discreet look makes the precise, advanced LED technology visible.
- 💡 The efficient recessed LED luminaire produces up to 112 lm/W and causes only little maintenance effort. Further energy savings are achieved through daylight-based and blinds control as well as through presence and time-based management.

## Team office

### More than the sum of individual workstations

Successful companies are characterised by team spirit as well as the right mix of interdisciplinary and multicultural cooperation. In this context, traditional face-to-face communication still prevails, for which the team-oriented office type for 3 to 20 employees (at 40 per cent still the most frequent type worldwide) offers ideal conditions.





**LIGHT FIELDS evolution**  
recessed LED luminaire



**LITECOM**  
lighting management system



With tunableWhite luminaires, light colours and illuminance levels can be adjusted to individual preferences, thus increasing people's sense of well-being.



Due to its clear lines, the luminaire subordinates to the architecture. Varied lighting scenes with adjustable light colours provide a high level of individuality.



The efficient recessed LED luminaire produces up to 124 lm/W. Lighting control using presence and time-based management, daylight-based automation as well as blinds control reduce maintenance and energy costs to a minimum.

## Office cubicle

For highly focused individual work

Lighting concepts for office cubicles meet the needs of individual employees, promoting concentrated work. 60 per cent of working hours are still put into traditional screen-based work, again emphasising the significance of glare protection. Perceptible luminance levels in particular contribute to a stimulating, open or a quiet, seclusive room ambience.



**SEQUENCE**  
LED pendant luminaire



**LITECOM**  
lighting management system



- ♥ SEQUENCE offers good contrast rendering and due to revolutionary and individual addressing, it provides a future-proof basis for a wide variety of tasks.
- 👆 The innovative, slim-line SLOTLIGHT luminaire ensures a soft transition of light. At the same time, the room can be structured into individual zones.
- 💡 The efficient pendant LED luminaire with precise lens optic produces 100 lm/W. Additional energy savings are achieved through daylight-based and blinds control as well as through presence and time-based management.

## Conference room

### Communication for innovation

Communication is the key to innovation. Apart from a functional communicative culture and meeting organisation, the room ambience, too, contributes to creating an atmosphere that enhances communication. It is precisely in conference rooms, where there is frequently only little daylight, that artificial lighting must meet this requirement.



**LINCOR**  
pendant LED luminaire



**LITECOM**  
lighting management system



- ♥ Glare-free task lighting is combined with beneficial direct/indirect light distribution by the LINCOR pendant luminaire. The large diffuse panels of the ONDARIA circular luminaire facilitate the eye's adaptation to interiors and provide for a bright, friendly atmosphere.
- 👉 Individual lighting scenes are created through the varied interaction of task luminaire, accent lighting and diffuse wide-area lighting.
- 💡 At a direct/indirect ratio of 83 : 17, LINCOR pendant luminaires achieve a high level - both in terms of energy efficiency and comfort. Lighting management with daylight-based control reduces energy costs and maintenance effort.

## Reception

It is the first impression that counts

The core functions of the reception area are: to offer orientation, to create recognition value for brands and companies, to connect people within the building. In this context, it is above all people that are responsible for the first impression of the company. So it is all the more important to promote satisfaction at work through traditional ergonomic measures.



**ONDARIA**  
opal circular luminaire



**LITECOM**  
lighting management system



Highly focused, wide-area luminance levels in communication and break-out zones make an essential contribution to stimulating the staff members. In the tunableWhite version, ONDARIA offers even more added value for people's well-being.



In the break-out zone, the circular luminaire design of ONDARIA forms a contrasting element with respect to the traditional work setting.



Utmost energy efficiency of up to 100 lm/W is achieved thanks to efficient backlit technology. Reduced maintenance and energy costs result from lighting management and time-based management.

## Break-out zone

### Charming oasis of inspiration

Gone are the times when working meant sitting rigidly at one's desk for hours. The residential character of break-out zones, enhanced by a matching lighting solution, provides the necessary ambience for feeling at ease, relaxing and recharging one's batteries - an atmosphere where ideas will start flowing.



**LIGHT FIELDS evolution**  
wall-mounted LED luminaire



**LITECOM**  
lighting management system



Laterally arranged luminaires avoid "lighting pressure", unilateral luminance levels in the upper half of the room support the pleasantly open character of the corridors.



If the stylish task lighting is suitably continued in the corridors, architecture and design speak the same language. This creates a clear identity.



The energy-efficient surface-mounted LED luminaire produces up to 93 lm/W. Through additional presence and time-based management, electricity costs are reduced even further.

## Corridors

### Movement and encounters

Apart from the reception area, access areas and circulation routes are decisive for the first impression. For instance, corridors count among the important zones of informal communication where sufficient cylindrical illuminance provides for good perception of faces and pleasant encounters. The lighting management plays a decisive role in terms of energy efficiency and emergency lighting.



**MELLOW LIGHT V**  
recessed LED luminaire



**LITECOM**  
lighting management system



♥ MELLOW LIGHT V illuminates the rooms in a very uniform manner, thus creating a sense of well-being - during video conferences just like during other forms of room utilisation.

👆 Face-to-face communication or video conferences: predefined lighting scenes can be called up depending on the respective needs, thus supporting individual situations.

💡 Presence and time-based management complete the savings package with top energy efficiency. The high efficiency of MELLOW LIGHT V with up to 108 lm/W is supported in use through presence and time-based management.

## Video conferencing room

### Networked long-distance communication

In the age of globalisation and networking, video conferences have found their way into the everyday work routines of many companies. Here, the lighting solution must comply with the special requirements placed on video conferencing rooms and also meet traditional ergonomic specifications for computer workstations - with a view to multiple room utilisation.



**CIELOS**  
modular lighting system



**LITECOM**  
lighting management system



- ♥ Luminaire arrangement and high illuminance levels provide for uniformity and accordingly a stimulating communication atmosphere.
- 👆 Comfortable design and large diffuse areas create a sense of identity through an open, stimulating room ambiance.
- 💡 Lighting control and time-based management reduce the energy costs of the lighting solution. The efficient CIELOS luminaire with LED achieves a light output ratio of up to 125 lm/W.

## Informal communication area

### Free space for variety

Trend scouts and office experts have shown that it is spontaneous, informal communication, e.g. in the kitchenette, in particular that promotes creativity within the team. For the architecture and the lighting concept this means that secondary areas should receive greater attention within the design concept.

## Lighting management

LITECOM focuses the light on the user

# LITECOM

The new LITECOM lighting management system offers unlimited flexibility in terms of operation, function and system size. Each luminaire and each blind is designed to provide maximum visual comfort, offers unrestricted individuality – and uses all options for energy efficiency at the same time. The innovative app concept facilitates exact adjustment to the needs of the respective building and its users. The desired functions can be added in the form of apps at any time. Basic functions of the lighting system and building services are already covered by the Basic app. Operation is effected through any type of momentary-action switch and control point, by means of smartphones, tablets or PCs.







#### **The new generation of lighting management:**

- The LITECOM app concept opens up a new dimension of flexibility for lighting management systems. The range of functions offered extends from daylight via shows up to emergency lighting.
- Designed as an open system, LITECOM enables the programming of your own apps, addressing of field bus systems such as KNX, or integration of lighting and blinds control into a building management system via BACnet or OPC.
- Thanks to LITECOM wizards, no prior knowledge is required to commission the system in just a few steps.
- Mobile interaction has already been included in the standard version. All Web-enabled devices are able to communicate with LITECOM.
- The multi-language user interface combines personal design options with intuitive operation – based on scientific findings and user analyses.
- LITECOM can be adjusted to customer-specific needs, thanks to individually extendable functions and project sizes (up to 250 actuators for LITECOM, up to 100,000 actuators for LITECOM infinity).

# Emergency lighting and emergency lighting systems

ONLITE offers safety as a one-stop solution

Functional emergency lighting is more than just a must required under the law. The quality of luminaires and supply system reflects the operator's responsibility towards employees, towards the building and the environment. Here, quality stands the test, not only in an emergency. ONLITE emergency and escape sign luminaires cannot fail to impress in everyday life – on account of their unobtrusive design and their capability of integration into the interior. Zumtobel attaches great importance to all technical quality criteria such as maximum energy efficiency and highly convenient maintenance. Based on many years of experience in the sphere of LED, the entire ONLITE product group relies on the latest in durable LED technology and a perfectly matching power supply system in emergencies.



## **PURESIGN and COMSIGN 150 escape sign luminaires**

- Design meets the highest technical lighting, ergonomic and aesthetic requirements
- Developed by the renowned EOOS design studio
- iF-Design Award and Good Design Award for PURESIGN
- Perfect integration into the architecture: e.g. the cord-suspended COMSIGN appears to float in space
- Escape sign luminaires with ERI spots provide emergency lighting in corridors and stairwells
- Only 4.5 W installed load



#### RESCLITE emergency luminaires

- The compact size makes the luminaires almost invisible, the high-grade aluminium cover blends harmoniously into the ceiling
- Unique optics allow for wide spacing, thus reducing investment costs: RESCLITE escape for escape routes, RESCLITE antipanic for meeting rooms
- Extremely easy design and installation



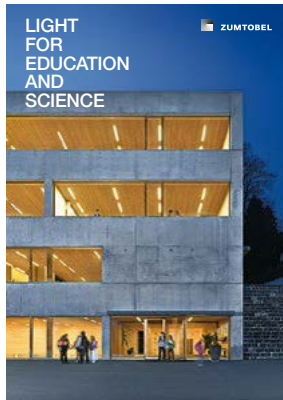
#### Central emergency supply system eBox

- Maximum functionality at low space requirement, perfectly matched to Zumtobel LED emergency and escape sign luminaires
- Also possible: use in standard luminaires with mains voltage of 230 V AC or 216 V DC
- Flexible use owing to clearly laid-out system and modular plug-in technology as well as SUB distribution cabinet in IP 20
- Easy handling from installation via operation through to maintenance





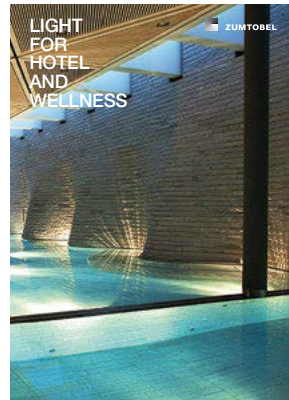
zumtobel.com/office



zumtobel.com/education



zumtobel.com/shop



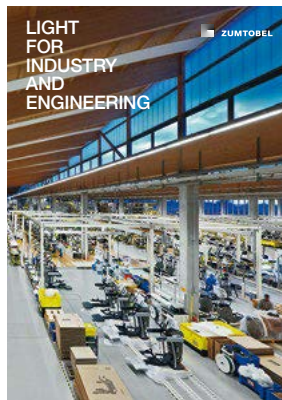
zumtobel.com/hotel



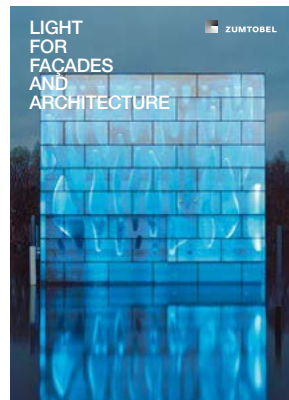
zumtobel.com/culture



zumtobel.com/healthcare



zumtobel.com/industry



zumtobel.com/facade

**Zumtobel is the internationally leading supplier of integral lighting solutions for professional interior and exterior lighting applications.**

- Offices and Communication
- Education and Science
- Presentation and Retail
- Hotel and Wellness
- Art and Culture
- Health and Care
- Industry and Engineering
- Façades and Architecture

We provide unique customer benefits by integrating technology, design, emotion and energy efficiency. Under the Humanergy Balance concept, we combine the best possible ergonomic lighting quality for an individual's well-being with the responsible use of energy resources. The company's own sales organisations in twenty countries, as well as commercial agencies in fifty other countries, form an international network of experts and design partners providing professional lighting consulting, design assistance and comprehensive services.

**Lighting and sustainability**

In line with our corporate philosophy *"We want to use light to create worlds of experience, make work easier and improve communications and safety while remaining fully aware of our responsibility to the environment"*, Zumtobel offers energy-efficient high-quality products, while at the same time making sure that our production processes based on the considerate use of resources are environmentally compatible.

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



**Top quality – with a five-year guarantee.**

As a globally leading luminaire manufacturer, Zumtobel provides a five year manufacturer's guarantee on all Zumtobel branded products subject to registration within 90 days from the invoice date and in accordance with the terms of guarantee at [zumtobel.com/guarantee](http://zumtobel.com/guarantee).

Order no. 04 924 350-EN 09/2014 © Zumtobel Lighting GmbH  
 Technical data was correct at time of going to press.

We reserve the right to make technical changes without notice. Please contact your local sales office for further information. For the sake of the environment: Luxo Light is chlorine-free paper from sustainably managed forests and certified sources.





Tracks and spots



Modular lighting systems



Downlights



Recessed luminaires



Surface-mounted and pendant luminaires



Free-standing and wall-mounted luminaires



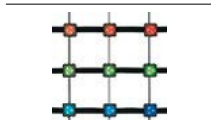
Continuous-row systems and individual batten luminaires



High-bay luminaires and floodlight reflector systems



Luminaires with extra protection



Façade, media and outdoor luminaires



Lighting management systems



Emergency lighting



Medical supply systems

### United Kingdom

Zumtobel Lighting Ltd.  
Chiltern Park  
Chiltern Hill, Chalfont St. Peter  
Buckinghamshire SL9 9FG  
T +44/(0)1753 482 650  
F +44/(0)1753 480 350  
uksales@zumtobel.com  
zumtobel.co.uk

### USA and Canada

Zumtobel Lighting Inc.  
3300 Route 9W  
Highland, NY 12528  
T +1/(0)845/691 6262  
F +1/(0)845/691 6289  
zli.us@zumtobel.com  
zumtobel.us

### Australia and New Zealand

Zumtobel Lighting Pty Ltd  
333 Pacific Highway  
North Sydney, NSW 2060  
T +61/(2)8913 5000  
F +61/(2)8913 5001  
info@zumtobel.com.au  
zumtobel.com.au

### China

Zumtobel Lighting China  
Shanghai office  
Room 101,  
No 192 YIHONG Technology Park  
Tianlin Road, Xuhui District  
Shanghai City, 200233, P.R. China  
T +86/(21) 6375 6262  
F +86/(21) 6375 6285  
sales.cn@zumtobel.com  
zumtobel.cn

### Hong Kong

Zumtobel Lighting Hong Kong  
Unit 4319-20, Level 43,  
Tower 1, Metroplaza,  
223 Hing Fong Road,  
Kwai Fong, N.T.  
T +852/(0)2503 0466  
F +852/(0)2503 0177  
info.hk@zumtobel.com

### India

Zumtobel Lighting GmbH  
1522, Devika Tower,  
6, Nehru Place,  
110019 New Delhi  
T +91/11 4601 2782  
info.in@zumtobel.com

### Singapore

Zumtobel Lighting Singapore  
158 Kallang Way # 06-01/02  
Singapore 349245  
T +65 6844 5800  
F +65 6745 7707  
info.sg@zumtobel.com

### United Arab Emirates

Zumtobel Lighting GmbH  
4B Street, Al Quoz Industrial Area  
Dubai, United Arab Emirates  
T +971/4 340 4646  
F +971/4 299 3531  
info@zumtobeluae.ae  
zumtobel.ae

### Romania

Zumtobel Lighting Romania SRL  
Radu Greceanu Street, no. 2,  
Ground Floor, sector 1  
012233 Bucharest  
T +40 731 32 1200  
welcome.ro@zumtobel.com  
zumtobel.com

### Hungary

Zumtobel Lighting Kft  
Váci út 49  
1134 Budapest  
T +36/(1) 3500 828  
F +36/(1) 3500 829  
welcome@zumtobel.hu  
zumtobel.hu

### Croatia, Bosnia and Herzegovina

Zumtobel Licht d.o.o.  
Radnička cesta 80 – Zagrebtower  
10000 Zagreb  
T +385/(1) 64 04 080  
F +385/(1) 64 04 090  
welcome@zumtobel.hr  
welcome.ba@zumtobel.com

### Serbia

Zumtobel Licht d.o.o.  
Karadjordjeva 2-4  
Beton Hala  
11000 Belgrade  
T +381/(0)11 65 57 657  
F +381/(0)11 65 57 658  
welcome@zumtobel.rs

### Czech Republic

Zumtobel Lighting s.r.o.  
Jankovcova 2  
Praha 7  
17000 Praha  
T +420/(2) 66 782 200  
F +420/(2) 66 782 201  
welcome@zumtobel.cz  
zumtobel.cz

### Slovak Republic

Zumtobel Lighting s.r.o.  
Vlčie Hrdlo 1,  
824 12 Bratislava  
welcome@zumtobel.sk  
zumtobel.sk

### Poland

Zumtobel Licht GmbH Sp.z.o.o.  
Platinum III  
ul. Wołoska 9a  
02-583 Warszawa  
T +48/(22) 856 74 31  
F +48/(22) 856 74 32  
welcome@zumtobel.pl  
zumtobel.pl

### Slovenia

Zumtobel Licht d.o.o.  
Štukljeva cesta 46  
1000 Ljubljana  
T +386/(1) 5609 820  
F +386/(1) 5609 866  
welcome@zumtobel.si  
zumtobel.si

### Russia

Zumtobel Lighting GmbH  
Official Representative Office  
Skakovaya Str. 17  
Bld. No 1, Office 1104  
125040 Moscow  
T +7/(495) 945 36 33  
F +7/(495) 945 16 94  
info-russia@zumtobel.com  
zumtobel.ru

### Norway

Zumtobel Belysning  
Hoffsveien 4  
Postboks 1025 Hoff  
0218 Oslo  
T +47 22 06 50 50  
info.no@zumtobel.com  
zumtobel.no

### Sweden

Zumtobel Belysning  
Birger Jarlsgatan 57  
11356 Stockholm  
T +46 8 26 26 50  
info.se@zumtobel.com  
zumtobel.se

### Denmark

Zumtobel Belysning  
Store Kongensgade 118  
1264 København  
T +45 35 43 70 00  
info.dk@zumtobel.com  
zumtobel.dk

### Headquarters

Zumtobel Lighting GmbH  
Schweizer Strasse 30  
Postfach 72  
6851 Dornbirn, AUSTRIA  
T +43/(0)5261 212-0  
info@zumtobel.info

Zumtobel Licht GmbH  
Grevnemarschstrasse 74-78  
32657 Lemgo, GERMANY  
T +49/(0)5261 212-0  
F +49/(0)5261 212-7777  
info@zumtobel.de

### zumtobel.com

# LIGHT FOR OFFICES AND COMMUNICATION

