

*Light for Industry
and Engineering*



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EXIT

EXIT

FIRE

Active Light | Connecting with Nature

Creating Light Creates Precision

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Active Light in industry is as unique and dynamic as the employees, the processes and the layout of different production halls. Human Centric Lighting puts the focus of the lighting design firmly on the individual. Visual, emotional and biological needs are fully supported by a blend of Active Light and additional workplace-oriented lighting for work during the day and the night. This approach also facilitates accurate working and improved quality. Pioneering lighting solutions with activity-based lighting use innovative sensor technology to automatically adapt to the specific situation.

Find out how Active Light works:
zumtobel.com/activelight



Intensity

Dynamically adjusted lighting levels help employees with their regular visual tasks. Active Light helps reduce error rates and increase worker safety.



Direction

Uniform and shadow-free illumination minimises glare – even with glossy surfaces. Adjusting the direction of the light towards the visual object with Active Light enhances visual quality. Precise work is promoted and fatigue is simultaneously kept to a minimum.



Colour

Active Light means tailoring light colours to reflect age, user preference and working hours, increasing well-being and boosting employee productivity.

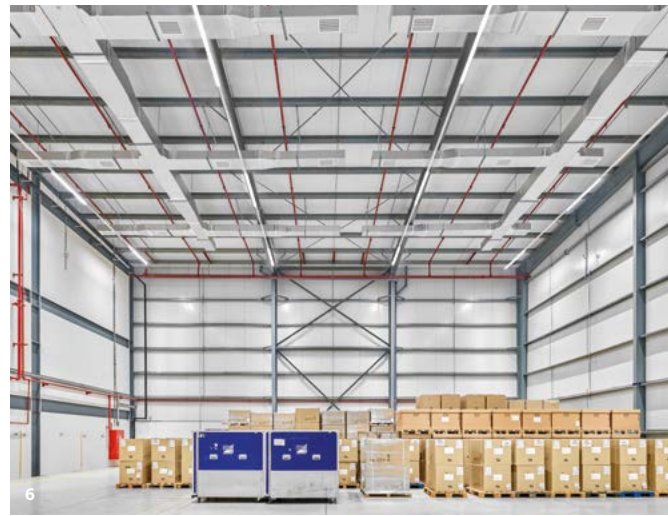


Time

Artificial light based on the natural course of the day helps support the internal clock. Luminaires controlled by sensors, which only switch on when light is required, reduce costs and minimise energy consumption.

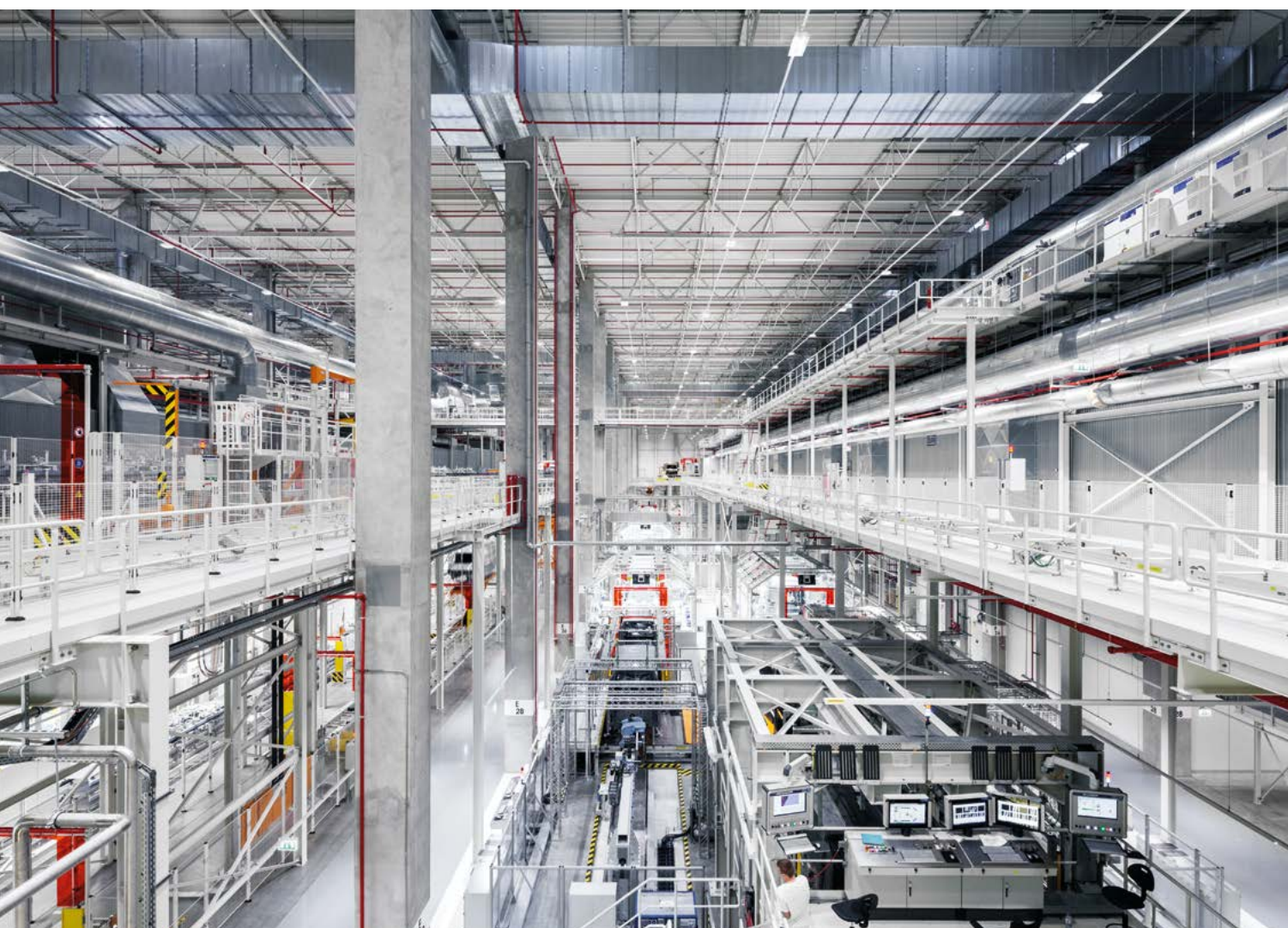
- 1 Hawe Hydraulik, Munich | DE
- 2 Diesel SPA, Molvena | IT
- 3 Gebrüder Versteijnen Transport, Tilburg | NL
- 4 Heron, Dornbirn | AT
- 5 Holzbau Deppeler, Leuggern | CH
- 6 Weiss-Röhlrig Logistics Center, Dubai | UAE
- 7 Ölz, Dornbirn | AT





Volkswagen factory, Wrzesnia | PL

LED lighting solution: TECTON continuous-row lighting system, CRAFT high-bay luminaire



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Durst Phototechnik AG, Lienz | AT

Architect: Arch. DI Peter Paul Rohrer, Lienz | AT

Electrical planner: Technisches Büro Technoterm, Lienz | AT

Electrical installation: ARGE Elektro Ortner GmbH and Elektro-Kühlung Duregger GmbH, Lienz | AT

LED lighting solution: TECTON continuous-row lighting system, CRAFT high-bay luminaire,

ONDARIA surface-mounted luminaire, PANOS infinity and MICROS downlight series,

CIELOS modular lighting system, SLOTLIGHT light line, outdoor luminaires and recessed ground spotlights by Bega

1

Adaptability

In these days of increasing digitalisation, more and more work processes run completely automatically. Industry 4.0, where man and machine communicate directly with one another using intelligent digital systems, is within reach. As an active part of the overall system, light will work as a connecting element – for example, to collect data or to aid navigation.

Light connects.

2

Productivity

The job market is influenced by high education standards and qualifications, as well as by demographic changes. Companies have to respond to these changes and adapt their lighting to suit increasingly complex work processes, diverse visual tasks and the individual needs of employees.

Light focuses on people.



3

Reliability

Thanks to the wide range of environmental conditions in industrial facilities and production areas, lighting systems need to be both reliable and application-specific. Rather than uniform solutions, these projects demand reliable and resistant products that are optimised to meet individual application requirements and customer needs.

Light is resistant.

4

Efficiency

Resources are becoming more and more scarce. One direct consequence of this phenomenon is steadily rising energy costs. This calls for a rethink – particularly in environments in which luminaires are almost constantly in use. The combination of LED luminaires and lighting control systems provides an energy efficient solution that cuts both energy and maintenance costs.

Lights offers more than just efficiency.

1 *Adaptability*

Lighting connects.



ASTA Elektrodraht GmbH, Oed | AT

Electrical planner: Auer & Ofenluger GmbH, Weiz | AT

LED lighting solution: CRAFT wide-beam high-bay luminare, SCUBA moisture-proof luminaire on TECTON trunking, CLEAN clean-room luminaire, LIGHT FIELDS evolution office luminaire, PANOS infinity downlight series, Olsys outdoor luminare from Thorn, CROSSIGN escape-sign luminaire, ONLITE central eBox emergency lighting system



“Industry 4.0 means the digitalisation of industrial value creation. In the last few years we have seen that manufacturing industries are producing products that are more individual and adaptable. The aim is to manufacture these individual products at the same price as mass-produced products. This requires an adapted and flexible supply of information at the workplace, as well as innovative concepts in workplace design. Until now workplaces have been designed in a very standardised way and every employee has just had to get along with that. We have now taken the first step in changing this with Zumtobel as our partner. We have created workplace systems with lighting solutions that automatically adapt to individual needs and the respective task. By doing this we hope to increase the productivity and motivation of employees.”

Dr Sebastian Schlund, Head of Competence Center
Production Management, Fraunhofer IAO, Stuttgart | DE

Production processes in industrial companies are now changing at increasingly shorter intervals. The same space regularly has to satisfy different utilisation scenarios and visual requirements. Lighting systems should have a high degree of flexibility so that they can be quickly adapted to layout changes, reducing production downtime to a minimum. Trunking systems represent an especially good basis for lighting, as the luminaires can be moved quickly and easily without any tools. Adaptability can be further enhanced by using an ATIVO multisensor. Motion and light measurement zones can be changed with a simple click of the mouse. Time-consuming repositioning of sensors is therefore a thing of the past.

Industry 4.0 has the potential to optimise industrial processes in terms of adaptability and productivity even further in the future. In this context, lighting can play a significant role. For example, the level of illuminance automatically adapts to the task at hand and therefore always provides the perfect lighting conditions. Furthermore, connecting communication and machines and systems and products can further increase productivity in the form of reduced production times, data analysis or lower error rates.



A workplace concept for Industry 4.0

Fraunhofer IAO and Zumtobel have developed a customised workplace concept that recognises which employee is at which workplace and the specific activity that they are carrying out. Using this information, it is possible to provide the right lighting at the right time and in the right place.

[zumtobel.com/com-en/activity-based-lighting.html](https://www.zumtobel.com/com-en/activity-based-lighting.html)



Activity-based lighting in industry

People are the focus of activity-based lighting. The lighting adapts to the task that is currently being carried out. The right mix of static, automated and, above all, dynamic lighting moods increases well-being and delivers the best possible light for the specific activity.

[zumtobel.com/com-en/activity-based-lighting.html](https://www.zumtobel.com/com-en/activity-based-lighting.html)

2 Productivity

Lighting is human-centred.



IWL workshops for people with disabilities, Landsberg | DE

Field study on biologically effective lighting

LED lighting solution: SCUBA moisture-proof luminaire (indirect lighting 17000 K), CRAFT high-bay luminaire (direct lighting 4000 K), automatic adjustment of the illuminance throughout the day



“Production work frequently involves shift work. Today there is no doubt that shift work increases the risk of accidents and affects the quality of sleep. Room lighting can have a positive impact there, especially in times of increased workloads due to an erratic lifestyle. A ‘productive’ lighting solution therefore satisfies visual and biological needs. In many cases lighting solutions like this include lighting controls that can modify light intensity and light colour according to working time and shift models.”

Dipl.-Ing. MMag. Markus Canazei, MSc
Bartenbach GmbH, Aldrans | AT

The demands on workers will noticeably increase in the future. Routine functions will become more and more automated, while increasingly complex tasks that demand manual intervention will require appropriately trained employees. Beyond that, there is the issue of demographic change. Shifting age patterns in the workforce bring about new workplace requirements. Good light quality is the basic requirement for the well-being of employees, helping to make sure that they are motivated and can concentrate sufficiently to deal with such highly complex tasks. This increases performance and markedly lowers error rates.

In addition to its visual and emotional effect, light at the workplace is also important in terms of biology. Light with shortwave, blue spectral components has an activating effect, whereas warm-white light has a relaxing influence. Biologically effective lighting can provide long-term support in terms of employee health, particularly in production areas without natural daylight or for night-shift operations. The natural sleep-wake rhythm is enhanced through targeted use of illuminance and light colours that imitate natural daylight.

**Zumtobel Research:
Biological effectiveness of dynamic light**

For many years Zumtobel has examined the positive effect of light on the well-being and productivity of employees in the workplace. The results of two academic research projects on this topic are available for complimentary download as white papers.

zumtobel.com/industry



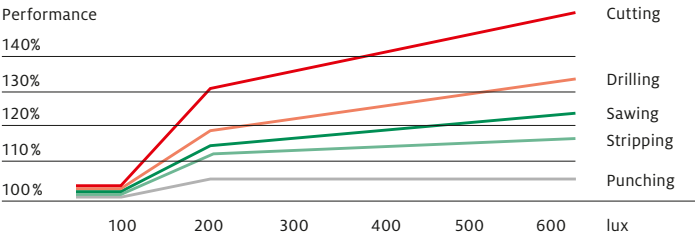
The impact of changing room light on the productivity of permanent morning shift workers at industrial workplaces



Laboratory experiment on influencing productivity through dynamic lighting effects

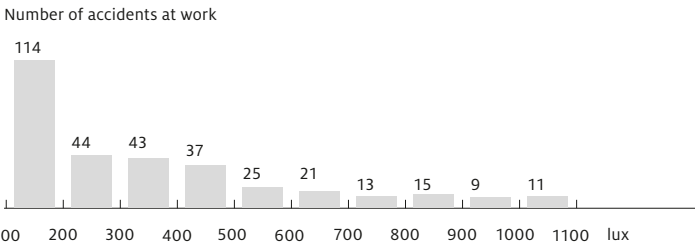
A high level of illuminance increases performance

Source: Ilmenau Technical University: "Using better lighting", final report Gall, Völker.



A higher level of illuminance reduces the number of accidents at work

Source: Ilmenau Technical University: "Using better lighting", final report Gall, Völker.



3 *Reliability*

Lighting is resistant.

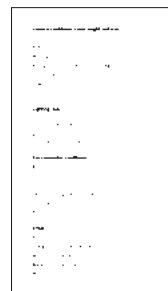


Gisinger Fahrzeugbau GmbH & Co KG, Hohenems | AT
LED lighting solution: CRAFT high-bay luminaire

Industrial and manufacturing enterprises are extremely diverse and characterised by very different environmental conditions. The demands on lighting in individual applications are equally diverse. No single solution can meet the demands of every industrial application. Identifying the prevailing environmental influences therefore plays a significant role when selecting the right lighting. The technical components of a luminaire should be protected against overheating in the case of very high temperatures. No liquids or foreign objects should enter the housing in areas with increased moisture and dirt accumulation. During intensive cleaning processes and in chemically polluted ambient atmospheres, special attention must be paid to the right choice of material in order to provide resistance against the substances present in the application. Application-specific standards and guidelines often contain lighting-related requirements that have to be fulfilled. Checklists can provide an overview and record the existing general conditions in an industrial project as comprehensively as possible.

Checklist for industrial lighting

In order to find a durable, reliable lighting solution for industrial applications, the general conditions and environmental influences have to be clarified precisely in advance. The checklist printed on page 41 can serve as a standard guide, helping to highlight crucial questions for preliminary enquiries.



Detailed information

More details about the most common key figures and standards can be found in the glossary on pages 34 to 39.



“Conditions are often dusty and therefore various deposits build up over time in the light fittings. Smooth surfaces and resistant materials are preferable – so-called hygienic design. Furthermore, we need to be sure that no foreign objects can fall from the lighting and that the diffusers cannot shatter. It is important to take into account product designs and reliable materials, which are compatible with the industry, as early as possible in the production development.”

Jürgen Berjak

IFS Auditor, Thuringia | AT

4 Efficiency

Light is more than efficient.



Weiler Möbel, Weiler | AT

Constructor: Prantl & Hagen GmbH & Co KG, Weiler | AT

Architect: Aicher ZT GmbH, Dornbirn | AT

Electrical planner: elplan Lingg Elektroplanungs GmbH, Schoppernau | AT

Electrical installation: Elektro Willi GmbH & Co KG, Andelsbuch | AT

LED lighting solution: VIVO spotlight system, TECTON continuous-row lighting system,

ONDARIA surface-mounted luminaire, INTRO modular lighting system,

PANOS infinity downlight series, CRAFT high-bay luminaire, SCUBA moisture-proof luminaire



“Lighting in industrial applications has to survive long operating hours, often in dirty and dusty environments. Energy efficiency and maintenance are therefore important topics that need to be taken into account when selecting luminaires. In the majority of cases, I recommend a combination of dimmable LED luminaires and lighting controls. As a result, unnecessary energy consumption is avoided and illuminance is ideally adapted to suit the respective visual task. When it comes to maintenance frequency it is useful to use luminaires with a higher degree of protection and greater resistance.”

Elmar Lingg

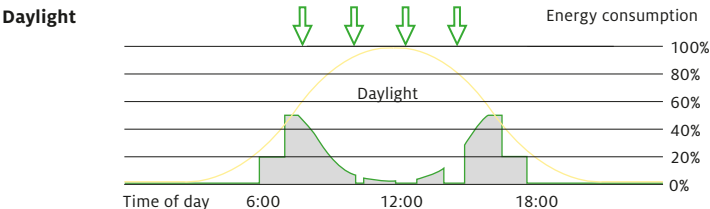
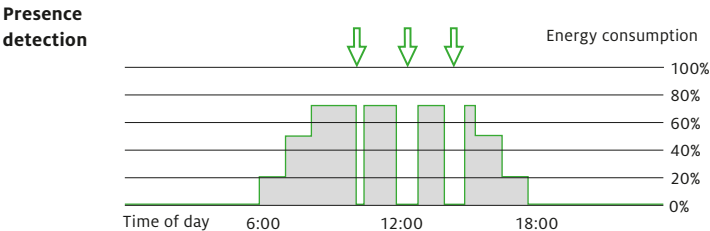
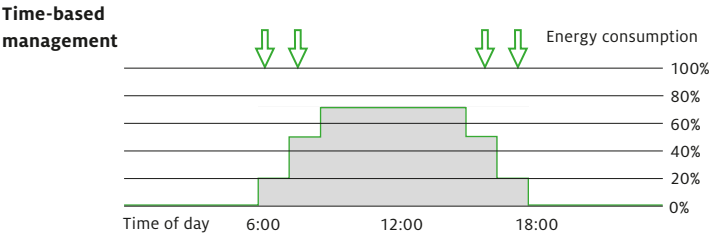
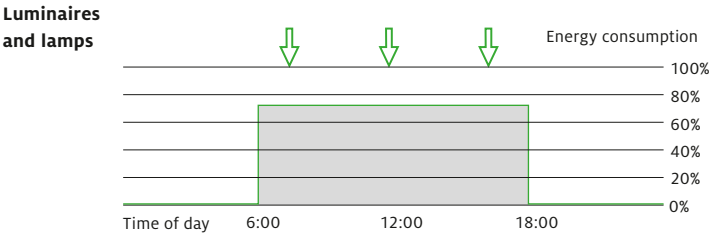
Managing director of elplan Lingg Elektroplanungs GmbH, Schoppernau | AT

Energy requirements in industrial enterprises are especially high due to long operating and production times. This has a negative impact on the carbon footprint and often leads to higher energy costs. Selecting the right lighting and controls system therefore contributes significantly to an optimised use of energy resources. Advanced electronic control gear with a dimming function can cut power consumption by up to 25 per cent. The intelligent use of presence sensors offers the possibility to further decrease the need for artificial light by 20 to 40 per cent. Centrally controlled time management systems ensure that the lighting is only switched on when it is really needed. Daylight sensors dim luminaires depending on the amount of daylight available, therefore guaranteeing a constant level of lighting.

ecocalc

ecoCALC is a tool for calculating and comparing the cost effectiveness of lighting solutions. Maintenance costs and CO₂ emissions can also be taken into account, along with investment costs.

zumtobel.com/ecocalc

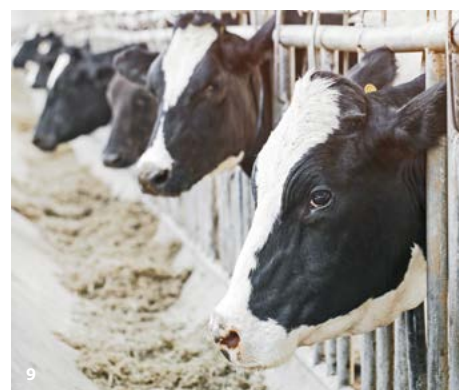




Application overview

Diversity demands versatility.

Industry is made up of many diverse areas, from heavy industry to clean-room applications. Lighting has to satisfy a variety of requirements and comply with the appropriate standards depending on the task. Zumtobel offers the right lighting solution for every requirement. In this way, every industrial application can be taken care of in the best possible way.



1 Logistics

Large halls and long operating hours require energy efficient lighting solutions with minimal maintenance costs.
Page 20

2 Metal working

Shiny surfaces, varied visual tasks and oily atmospheres are all part of the metal industry.
Page 22

3 Automotive

Lighting must be capable of providing optimal support in complicated assembly and body work.
Page 24

4 Food

Hygiene standards place high demands on the quality of the lighting.
Page 26

5 Chemicals and pharmaceuticals

Clean rooms in particular require special construction features and materials.
Page 28

6 Car parks

Intelligent lighting management and LED luminaires improve safety and boost energy efficiency.
Page 30

7 Quality checks

Optimal lighting conditions support inspection employees with complex visual tasks.
Page 30

8 Wood, paper and textiles

High degrees of protection are essential in atmospheres with increased dust and/or fibre accumulation.
Page 31

9 Agriculture

Luminaires with higher degrees of protection made of PMMA can withstand stubborn dirt and aggressive gases.
Page 31

Logistics



Ritzenhoff & Breker GmbH & Co. KG, Bad Driburg | DE

Electrical planner and electrical installation: Elektro-Licht Janzen & Stallmann GmbH, Bielefeld | DE

LED lighting solution: TECTON continuous-row lighting system, MIREL evolution office luminaire,

SCUBA moisture-proof luminaire, Thorn Omega luminaire, PERLUCE luminaire with higher degree of protection,

DIMLITE daylight lighting controls



Maintenance

Maintenance work in logistics warehouses with high ceilings is a time-consuming and expensive task. The luminaires are often very hard to reach, which is why replacing defective lamps or ballasts also takes a lot of time and effort. Durable LED luminaires reduce maintenance requirements to a minimum. Innovative constructions reduce dirt accumulation and mean that luminaires stay cool and are easy to clean.



Energy and cost savings

Long operating hours and immense spatial dimensions lead to high energy consumption. At least 20 per cent of operating costs in a logistics facility are for lighting. Efficient LED luminaires with targeted light control enable long-term reduction of these costs. In addition, lighting management systems with corridor functions can reduce lighting usage times – especially in those areas that are only occasionally used by people due to increasing automation.



Ideal illumination

Fork-lift drivers frequently have to look directly into light from a luminaire when loading and unloading high shelves. Ideal light quality with good glare suppression not only enhances productivity and motivation but also increases safety. Optics optimised for logistics guide the light in a targeted way to the place where the visual task is being conducted. High-bay warehouses benefit from the use of luminaires with narrow-beam optics that provide even illumination in vertical shelving areas. Horizontal transportation areas are also well illuminated.



High flexibility

Trunking systems offer added flexibility to respond quickly and easily to altered layouts. If LED optics are replaced, the general appearance of the luminaires remains unchanged, despite the different light distribution.

Special variety of logistics: cool zones, cold and frozen storage

Conventional lamps quickly reach their limits because of the low ambient temperatures. In contrast, low-maintenance LED luminaires can take advantage of minus temperatures. They have a longer life at average room temperatures and are more energy efficient, while the reduced heat load lowers the effort required for cooling.

Short installation and maintenance times for these applications are also crucial due to the difficult environmental conditions.



Find out more details about logistics applications in the brochure

Light for Industry and Engineering: Logistics

zumtobel.com/industry

Product recommendation

TECTON C
LED continuous-row luminaire



Metal working



Sapa Extrusion Nenzing GmbH, Nenzing | AT
Electrical planner: EGD Installations GmbH, Dornbirn | AT
LED lighting solution: CRAFT high-bay luminaire

Shiny surfaces

The range of visual tasks in the metal industry is particularly wide. General operations and detailed inspection work often occur side by side, even though they have individual requirements in terms of uniformity, glare and illuminance. Disruptive glare caused by reflection, which often occurs when working with reflective materials, can be minimised with uniform light distribution and the correct luminaire arrangement. This helps workers focus and limits potential sources of error.

Oily environments

Luminaires are regularly exposed to coolants, oil vapours and metallic dust in metal-working applications. Luminaires made of PMMA with high IP protection classes offer maximum robustness in these kinds of environments and prevent the entry of foreign objects. Conversely, optics made of PC should not be used, as they can break upon direct contact with oils and lubricants.

Durability

Our industrial LED luminaires are specially designed for demanding environments and are equipped for a long service life with the lowest possible reduction in luminous flux. High degrees of protection and carefully designed luminaire surfaces minimise unwanted dirt accumulation, so that expensive cleaning and service intervals can be deferred.

Variable work tasks

When it comes to metal working, one task rarely takes place in the same workplace for the entire service life of the lighting. If tasks in the production area change, lighting conditions also have to be adapted. Trunking systems are characterised by a high degree of flexibility and adaptability. The position, type and number of luminaires can be quickly and easily altered to suit the new visual task.



Find out more details about metal-working areas in the brochure

Light for Industry and Engineering: Metal working

zumtobel.com/industry



Material tests at Zumtobel.

In companies that manufacture, process or handle metals, luminaires made of PMMA offer maximum protection for reliable and maintenance-free operation over a long period of time. Polycarbonate, on the other hand, should not be used. If this comes into contact with oil and lubricants, there is a risk that it will break shortly afterwards.

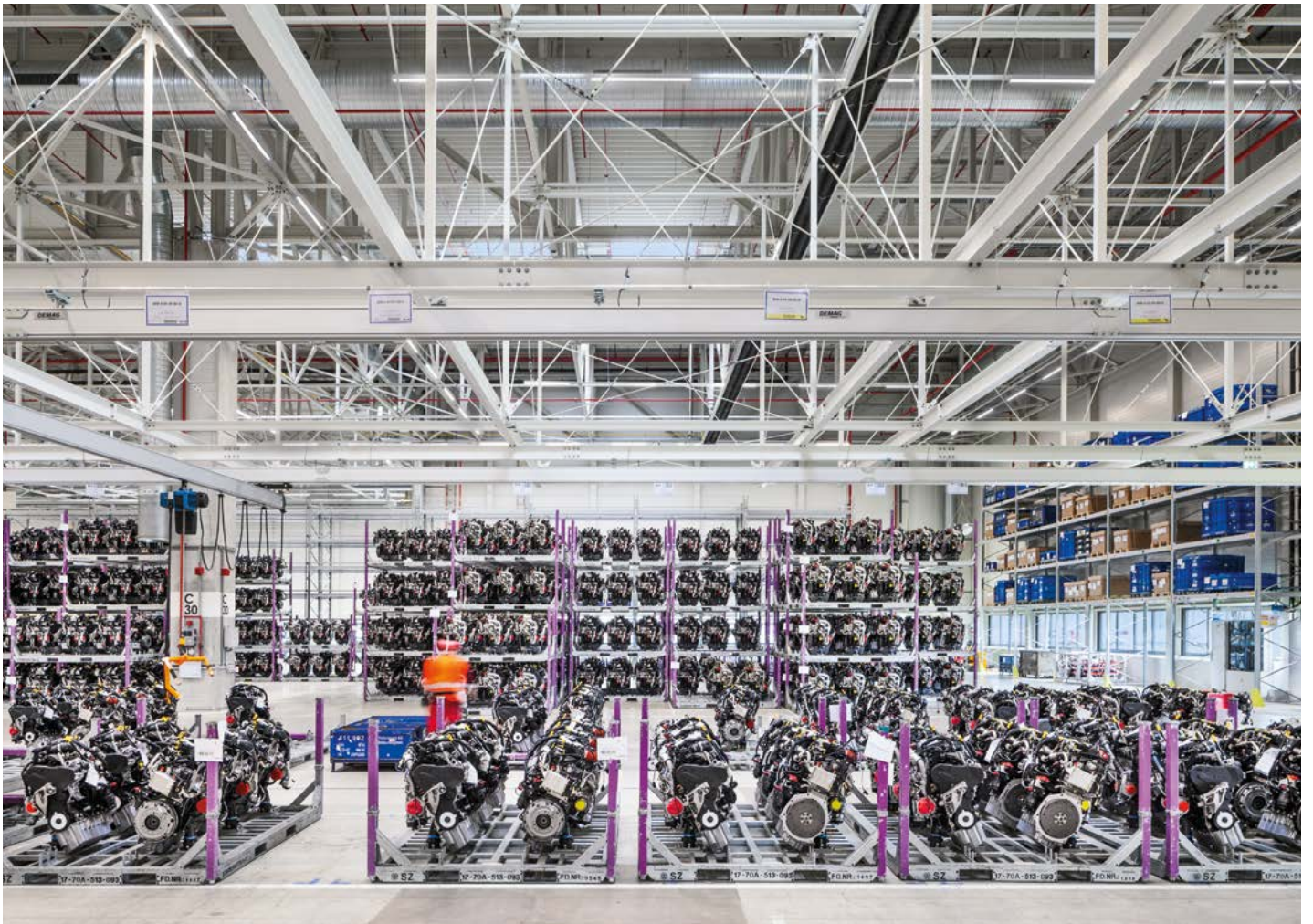
Product recommendation

CRAFT L
LED high-bay luminaire

TECTON C
LED continuous-row luminaire



Automotive



Volkswagen factory, Wrzesnia | PL
LED lighting solution: TECTON continuous-row lighting system,
CRAFT high-bay luminaire



Glare limitation

Body and assembly work in the automotive industry are demanding tasks that require perfect lighting conditions. As shiny metal surfaces are often found on production lines, the risk of direct glare and glare by reflection is particularly high. These have a negative impact on error rates, concentration and employee fatigue. Highly selective luminance and visible LED light points should be avoided to help reduce disruptive light reflections and subjective glare sensitivity. Luminaires with uniform, homogeneous light-emitting surfaces are recommended instead. If luminaires are arranged laterally and parallel to the production line, unwanted light reflections can be reduced even further.



Maintenance

Replacing defective lamps and luminaire components can sometimes be very time-consuming and costly in the automotive industry. Production processes have to be interrupted and the areas that need servicing are often in high halls that are difficult to reach and that require the use of lifting and climbing aids. Durable LED luminaires with higher protection and a carefully considered design help to extend service intervals and reduce maintenance costs.



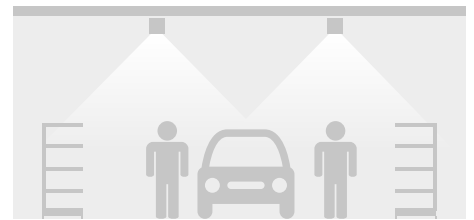
Silicone-free content & degree of protection

Silicone can negatively influence the fluid characteristics of material surfaces, which may disrupt painting processes and lead to visible errors on the product. Strict regulations often apply in the automotive industry, which prohibit the use of luminaires containing silicone in order to minimise the danger of contamination. In addition, using a higher degree of protection of at least IP5X is recommended for optics and LEDs in car manufacturing. Flying sparks caused by cutting work cannot penetrate the housing, helping to avoid potential soiling of and damage to the interior workings of the luminaire.



Efficiency

Considering the high lumen packages required in large production halls in the automotive industry, the energy requirements for lighting systems are particularly hefty and the system efficiency of LED luminaires is therefore especially important. Significant energy savings can be made by using dimmable LED luminaires.



Reflection-free light for demanding workplaces, such as automotive production lines, is guaranteed by lateral luminaire positioning.



Luminaires with microprism optics completely disperse individual LED light points. This allows for a reduction in subjective glare sensitivity and fewer spot reflections on reflective surfaces.

Product recommendation

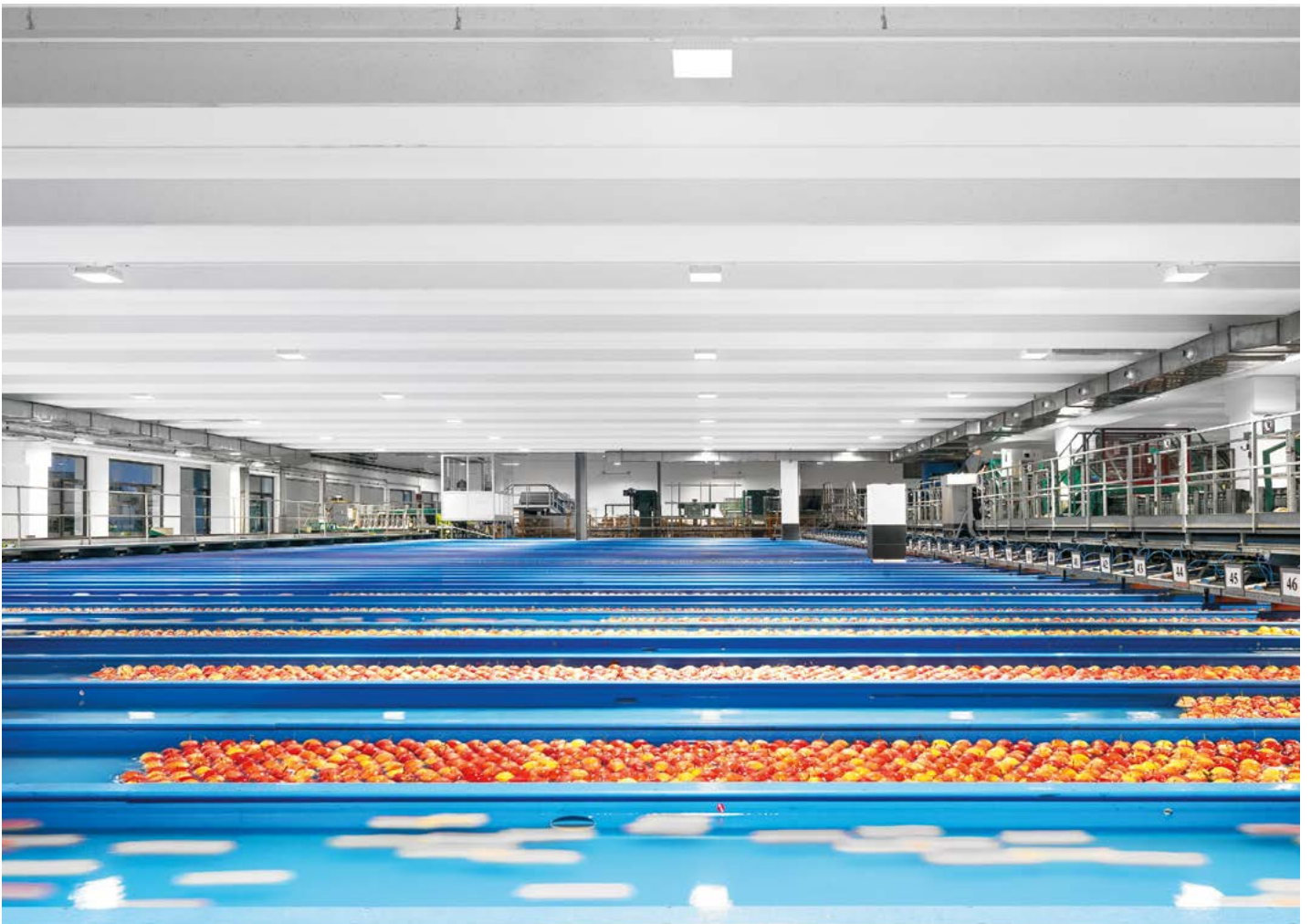
TECTON MPO
LED continuous-row
luminaire



LITECOM
lighting management



Food



Obstgenossenschaft Texel, Naturns | IT

Planning and construction management: Dr Siegfried Pohl, Latsch | IT

Electrical planner: M. & N. Plan Consulting, Burgstall | IT

Electrical installation: Elektro Gafriller GmbH, Barbian | IT

LED lighting solution: CRAFT wide-beam high-bay luminaire,
SCUBA moisture-proof luminaire, TECTON continuous-row lighting system,
ONLITE CPS central battery, daylight linking



Standards & guidelines

Lighting in the food industry is subject to strict guidelines in relation to product design and quality. Conditions are determined by standards and concepts, such as IFS, BRC or HACCP, and outline minimum requirements for the safe production of food products. Essentially, lighting solutions have to comply with the following requirements:

- **Protection against falling fragments** Luminaires must be designed to be unbreakable in order to prevent food contamination from falling parts. Fragile plastic or glass should be avoided. Lamps must be protected from fragmentation using a cover.
- **Surfaces that are easy to clean** Luminaires for the food industry have to be constructed in accordance with hygiene guidelines, so that any accumulation of dirt can be easily removed. Smooth and sealed surfaces are particularly important in product design. Selecting resistant materials made of CHEMO or PMMA, along with a high IP degree of protection, are important requirements to sustainably withstand intensive cleaning and disinfection processes in the food industry.



Extreme temperatures

While lighting systems are often exposed to very high temperatures in production areas in the food industry, extremely low temperatures are required for the storage of foods in deep-freeze facilities. Zumtobel products developed specifically for the food industry are designed for extreme conditions like these and can be permanently used in ambient temperatures ranging from -40°C to $+50^{\circ}\text{C}$.



Visual quality inspections

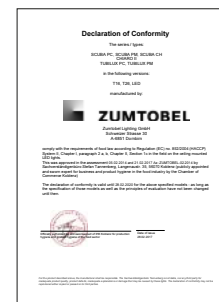
Before foods are packaged, they are normally subject to a visual inspection to see whether the products comply with freshness and quality requirements. The use of light sources with high colour rendering is recommended to help ensure a reliable assessment of even the smallest colour nuances.

IFS, BRC, HACCP

The most important standards and guidelines in the food industry aim to guarantee a high level of quality and safety in food production and processing areas.

Detailed information

More details about standards and a summary of possible lighting requirements can be found in the glossary on page 38.



Declaration of conformity

HACCP declarations of conformity are available for download for Zumtobel luminaires that have been developed for the food industry.

Product recommendation

AMPHIBIA CHEMO
moisture-proof
LED luminaire



CRAFT M FOOD
LED high-bay luminaire



Chemicals and pharmaceuticals



Pharmazeutische Fabrik Montavit GmbH (pharmaceutical production), Absam | AT

LED lighting solution: PANOS downlight series, PERLUCE
luminaire with extra protection, CLEAN clean-room luminaire,
ONLITE emergency lighting system



Demanding visual tasks

Demanding detailed tasks, such as working with test samples, require high illuminance and low levels of glare, particularly in laboratories. Disruptive light reflections on glassware can be reduced by using luminaires with a homogeneous light-emitting surface. For particularly tricky visual tasks, general lighting concepts can be optionally supplemented by individually adjustable workplace luminaires.



Clean rooms

An increasing number of products in the chemical and pharmaceutical industry are being produced in clean rooms in order to ensure high levels of quality. Relevant standards and guidelines, such as DIN EN ISO 14644 or GMP, precisely define the structural requirements for clean rooms to adequately minimise the danger of particulate or microbial contamination. Luminaires must comply with the following requirements so that they can be used in these strictly controlled areas:

- **Hygienic design** Particles can accumulate in luminaires with a high number of grooves. Even with thorough cleaning, these particles are very difficult to remove. Clean-room luminaires prevent this kind of contamination by having smooth and well-treated surfaces. High IP protection means that no dust or moisture can penetrate the luminaire housing during production.
- **Resistant surfaces** Clean-room systems are regularly cleaned and/or disinfected to comply with the relevant standards and guidelines. The materials used for the luminaires installed there have to be deliberately chosen to ensure resistance against aggressive cleaning agents and help avoid any potential source of danger for the finished product. The use of shatterproof glass or aluminium, for example, is suitable.



Simple maintenance

Maintenance work can be a complex task in clean rooms because clean-room qualification has to be ensured and validated again after the work. Clean-room luminaires should offer the possibility of being serviced from above – over technical areas. This means that the clean-room status is maintained and that maintenance efforts are kept to a minimum.

Clean rooms

A clean room is a segregated area in which the number of particles or germs in the air is kept as low as possible. The goal is to prevent unwanted influences on the production or the people.

Detailed information

There are more details about clean-room standards and the requirements for clean-room luminaires in the glossary on page 38.

Product recommendation

CLEAN advanced
clean-room LED luminaire



CLEAN classic
clean-room LED luminaire



Car parks

Lighting in car parks is used around the clock. A combination of energy efficient LED lighting solutions and corridor-function controls are ideal for keeping operating costs as low as possible. Vertical illuminance plays a crucial role safe parking and exiting, as well as safely crossing driving areas. Due to the low mounting heights in car parks, light distribution should be as wide as possible for even illumination. A slight indirect share creates a pleasant spatial atmosphere.



CITTI-Park car park, Flensburg | DE

Product recommendation

AMPHIBIA bmLink
moisture-proof LED luminaire

PST
Presence detector

Quality inspection

The work of a quality inspector requires the utmost concentration. Unevenness and minute errors have to be detected and corrected immediately. Ideal lighting conditions are an essential requirement for this work, providing employees with the best possible support for complex activities. Workplace lighting is usually used to supplement general lighting. This can be adapted for special requirements such as increased illuminance or separated light colours.




Quality inspection in the automotive industry

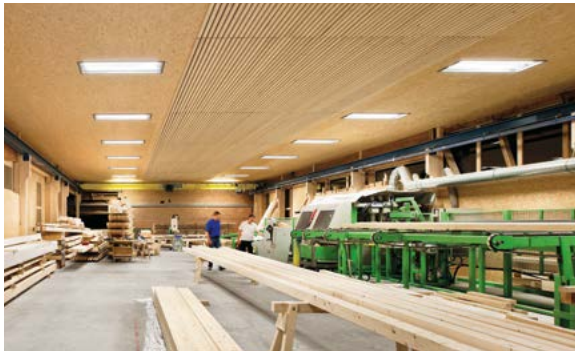
Product recommendation

COESA
LED luminaire for surface inspection

TECTON MPO
LED continuous-row luminaire

Wood, paper and textiles

Wood, paper and textile processing companies have an atmosphere that contains increased dust and/or fibre accumulation and are therefore classed as locations exposed to fire hazards. Only luminaires with a certain surface temperature can be used in these types of applications. These fittings are marked with the  icon. This label confirms that the outer surfaces of the luminaire, on which easily flammable substances can accumulate, do not exceed the temperatures specified in EN 60598-2-24, while also proving that the product provides the required protection against penetration of foreign objects and liquids.



Wood processing at Vonlanthen Holzbau AG, Schmiten | CH

Product recommendation

CRAFT
LED high-bay luminaire

AMPHIBIA
moisture-proof LED luminaire

Agriculture

Stubborn dirt and ammonia emissions associated with animal husbandry and the storage of manure are a major issue for farms. Luminaires with extra protection and particular materials are therefore ideal, especially PMMA, which is resistant against gases and aggressive cleaning agents commonly found in barns. An energy-saving LED lighting solution soon pays off due to the large size of the halls and the long operating hours.



Feeding in a cattle shed

Product recommendation

AMPHIBIA PMMA
moisture-proof LED luminaire

TUBILUX PMMA
moisture-proof LED luminaire

Quality assurance at Zumtobel

Products from Zumtobel fulfil the highest quality requirements, impress customers on account of their long service life and thereby set the standard for the industry. To ensure the continual improvement of products and services, Zumtobel has implemented an uncompromising quality management system. This has involved certifying all production locations in accordance with the international standard ISO 9001. Over and above this, Zumtobel is one of the few companies in this sector that has accredited measuring laboratories at its disposal, ensuring that the development process consistently operates at the highest level.



A detailed analysis of the the lighting performance guarantees that the planning data calculated corresponds exactly to reality and supports specific visual tasks in the best possible way.



In-depth EMC testing at the Zumtobel laboratory ensures optimal protection against electrostatic discharge, voltage spikes and transient voltage.



The water resistance of Zumtobel luminaires is tested under extreme conditions to maintain outstanding levels of reliability.

Glossary

LED quality

An LED is an electronic semiconductor component that emits light when electrical current flows through it. The light's wavelength depends on the semiconductor material and its doping. The LED spectrum only emits light (electromagnetic radiation in the visible range) and not ultraviolet or infrared radiation.

Luminous flux and efficacy

Luminous flux (lm), power (W) and luminous efficacy (lm/W) are important key figures that describe the efficacy of LED luminaires. These values have to be shown by manufacturers for all luminaires. The luminous flux and luminous efficacy of the installed LED modules are higher than those of the luminaire and therefore cannot be compared with one another. The values are given as rated values. This takes account of the fact that individual measured values can fluctuate slightly during the production period of a luminaire type.

Service life

The service life describes the time until the average luminous flux of an LED luminaire has dropped to a fixed percentage of the initial luminous flux. B50 is a statistical value that is indicated together with the service life of LED luminaires. It approximately denotes an average value for the reduction in luminous flux and is derived in accordance with established forecasting methods.

Example: The information "L80 50 000 h" means that the luminous flux has fallen on average to 80% of the initial value after operating 50 000 hours. It is common to indicate the "average rated service life".

Colour quality

During the production of LED chips, LEDs from various production batches can have different properties in terms of intensity, colour temperature, chromaticity coordinate or even forward bias.

The properties of each individual LED are measured after production and assigned a group with the same characteristics. These correspond to finely graded parameters, which are divided into so-called "bins". By using certain binning groups, the colour and brightness tolerances are reduced to a minimum so that illuminated areas have a uniform appearance. This is particularly important in applications with the greatest white light quality, such as museums. The concept of MacAdams ellipses gives the user information about the extent to which the scattering of individual LED modules differ in colour perception. In theory, 1 MacAdams is the term applied as soon as a visual difference in colour perception is visible. The colour difference between wide-beam luminaires with a high luminous flux, which can often be found in industry applications, is rated as high quality with 3 MacAdams ellipses.

Colour temperature

Colour temperature (also referred to as light colour) describes the colour appearance of light and is given in Kelvin (K).

Ww (warm white) up to	3300 K
Nw (neutral white)	3300-5300 K
Dw (daylight white) from	5300 K

Luminaires with fixed colour temperatures

stableWhite

- Set colour temperature with a certain tolerance range
- Usual for industrial applications: 4000 K, 6500 K
- Constant colour temperature when dimming/brightening

Luminaires with variable colour temperatures

Balanced tunableWhite

- Manual control of two colour temperatures
- Colour temperature between 2700 K and 6500 K
- Brightness and/or luminous flux dependant on light colour control
- Controlled via 2 DALI device type 6 or two separate channels
- Greater tolerance in terms of MacAdams levels

Calibrated tunableWhite

- Control of preset colour temperatures close to the Planck curve
- Colour temperature between 3000 K and 6000 K
- Constant luminous flux over the entire colour temperature range
- Control of two channels using DALI Device Type 8
- MacAdams 4

Expert tunableWhite

- Colour temperature control along the Planck curve
- Colour temperature between 2700 K and 6500 K
- Very constant luminous flux over the entire colour temperature range
- Control of several channels using DALI Device Type 8
- MacAdams < 4, Ra > 90

Both CRAFT and TECTON are available on request as Balanced tunableWhite.

Protection classes


Protection classes describe the measures taken to provide protection against touch-sensitive voltage. They are defined in the EN 61140 standard and classified with icons according to IEC 60417. Zumtobel divides luminaires into the following protection classes:

 = **Protection class I**

 = **Protection class II**

 = **Protection class III**

Protection class I luminaires

The luminaire is intended for connection to a protective earth conductor. There is no icon for protection class I. The sign for earthing  is frequently used. All Zumtobel luminaires are at least protection class I, unless otherwise indicated.

Protection class II luminaires

Protection class II luminaires have protective insulation but no protective earth conductor connection. There are certain protection class II luminaires in the Zumtobel range (e.g. moisture-proof batten luminaires and moisture-proof diffuser luminaires).

Protection class III luminaires

Luminaires labelled as protection class III are intended for operation with safety extra-low voltage (max. 50 Volts). There are protection class III luminaires included in the architectural luminaires (e.g. 2LIGHT mini and MICROS S).

IK impact resistance rating

The IK impact resistance rating or IK degree of protection is a measure of the resistance of electrical equipment housing against mechanical impacts. There are eleven degrees of protection in the international standard IEC 62262 (which corresponds to EN 62262):

Degree of protection	Impact energy (Joule)	Product
IK00	No impact resistance rating	
IK01	up to 0.15	
IK02	up to 0.20	
IK03	up to 0.35	AMPHIBIA PMMA
IK04	up to 0.50	
IK05	up to 0.70	TECTON MPO
IK06	up to 1.0	
IK07	up to 2.0	TECTON C LED
IK08	up to 5.0	CRAFT PM, AMPHIBIA PC
IK09	up to 10.0	
IK10	up to 20.0	

These provide information about which impact energy the housing can withstand without breaking. In practice the following maximum impacts can be anticipated.

Up to IK05:	Strike with hand or fist
IK06:	Strike with a 500 g hammer from a distance of 20 cm
IK07:	Strike with a 500 g hammer from a distance of 40 cm
IK08:	Strike with a 1.7 kg hammer from a distance of 30 cm
IK09:	Strike with a 5 kg hammer from a distance of 20 cm
IK10:	Strike with a baseball bat, a projectile or a kick

Degrees of protection

Degrees of protection indicate the following properties of equipment:

- the quality of its protection against direct contact
- its sealing against the ingress of solid foreign bodies (dust, stones, sand, etc.)
- its sealing against the ingress of water

The type of protection is defined by two degrees of protection in accordance with IEC 529:

- degree of shock-hazard protection and protection against the ingress of solid foreign bodies (1st digit)
- degree of protection against the ingress of water (2nd digit)

Degrees of protection for technical luminaires

First digit: Protection against the ingress of solid foreign bodies

- IP0X** Unprotected against the ingress of solid foreign bodies
IP1X Protection against solid bodies > 50 mm
IP2X Protection against solid bodies > 12 mm
IP3X Protection against solid bodies > 2.5 mm
IP4X Protection against solid bodies > 1 mm
IP5X Dust-protected (limited ingress of dust)
IP6X Dust-tight (no ingress of dust)

Second digit: Protection against liquids

- IPX0** No special protection
IPX1 Drip-proof – protection against water drops
IPX2 Protection against water drops up to 15° from the vertical
IPX3 Rain-proof – protection against spray water up to 60°
IPX4 Splash-proof – protection against spray water from all directions
IPX5 Jet-proof – protection against jets of water
IPX6 Protection against heavy seas (conditions on ship decks)
IPX7 Watertight – protection against immersion (pressure and time specified)
IPX8 Protection against immersion under pressure (with instructions from the manufacturer)

Example IP23:

IP INGRESS PROTECTION

- 2 Protection against penetration by solid foreign objects with a $\varnothing > 12$ mm (medium-sized foreign object). Keeps away fingers or objects.
- 3 Protection against water falling at any tilted angle up to 60°. There should be no adverse effects from spray water.

Applications for luminaires with increased protection

Damp locations

Bakeries	IPX1
Manure sheds	IPX1
Animal-feed preparation facilities	IPX1
Industrial kitchens	IPX1
Boiler rooms	IPX1
Commercial workshops	IP20
Granaries	IPX1
Cold storage (deep freeze)	IPX1
Pump houses	IPX1
Sculleries	IPX1
Laundries	IPX1

The following generally applies:

IPX5: for cleaning using water jets

IPX4: in rinsing areas

Wet locations

Beer or wine cellars	IPX4
Shower cubicles	IPX4
Meat processing facilities	IPX5
Electro-plating facilities	IPX4
Greenhouses	IPX4
Dairies	IPX4
Workshops using wet processes	IPX4
Car-wash areas	IPX4

The following generally applies:

IPX5: for cleaning using water jets

Agricultural facilities

Beer or wine cellars	IP44
Shower cubicles	IP44
Stores, storerooms for hay, straw, feedstuff	IP44
Intensive stock farming	IP44
Animal sheds	IP44
Adjoining rooms of animal sheds	IP44

The following generally applies:

IPX5: for cleaning using water jets

IP54+FF: with increased fire risk

Facilities with increased fire risk

Workrooms	IP50
Woodworking	IP50
Sawmills	IP50
Paper processing	IP50
Textile processing	IP50
Treatment and fabrication	IP50

Gymnasias and sports halls

Badminton courts	IP20
Squash courts	IP20
Indoor tennis courts	IP20
Gymnasias and sports halls	IP20
Ballproof luminaires	
Ballproof luminaires with an all-round cover; maximum mesh size 60 mm	

Explosion protection

Combustible gases, vapours and mist

Zone 0

A dangerous explosive atmosphere is constantly present or present for long periods.

Zone 1

A dangerous explosive atmosphere may occasionally occur.

Zone 2

A dangerous explosive atmosphere is unlikely. If it does occur, it will be for a short duration.

Combustible dust

Zone 20

Areas in which an explosive atmosphere consisting of a dust cloud compound is present constantly, for long periods or frequently.

Zone 21



Areas in which an explosive atmosphere consisting of a dust cloud compound is likely to occur occasionally for a short duration.

Zone 22

Areas in which an explosive atmosphere is unlikely to occur due to circulating dust. However, if it occurs it is in all likelihood very rare and only for a short duration.

Fire protection

Luminaires with the label

At locations exposed to fire hazards, surfaces on which highly flammable substances such as dust or fibres may accumulate with correct assembly must not exceed the temperature limits stipulated in EN 60598-2-24. Luminaires with the  label are constructed in such a way that they do not exceed 90°C on horizontal surfaces or 115°C in the event of a ballast fault. For vertical surfaces, the surface temperature remains below 150°C. This ensures that any dust and/or fibre deposits on the luminaire cannot ignite. In addition, these luminaires comply with an IP degree of protection of at least IP5X for applications with dust accumulation or IP4X for applications with combustible solid substances. Zumtobel's AMPHIBIA and CRAFT industrial luminaires are equipped with a  label.

Ballproof impact resistance

Luminaires for sports halls have to be ballproof in accordance with DIN VDE 0710-13. Objects hitting the luminaire must not damage the fitting in such a way that causes parts to fall down. For the standard test, the luminaire has to withstand 36 shots from three directions with an impact speed of up to 60 km/h. The ball used is the size of a handball. When selecting luminaires, the grid size of the cover grill must be matched to the sport. The grid should always be significantly smaller than the balls used and never big enough to enable balls to get stuck in the gaps. Zumtobel offers the CRAFT high-bay fitting as a ballproof impact-resistant luminaire.

Luminaires suitable for clean rooms

A clean room is a segregated area in which the number of particles or germs in the air is kept as low as possible. The goal is to prevent unwanted influences on the production and the people.

Standards and guidelines for cleanliness requirements:

Clean-room classification in accordance with DIN EN ISO 14644-1

The standard defines nine clean-room classes according to the maximum permissible particle concentration per m³: ISO class 1 corresponds to the highest cleanliness level and ISO class 9 is the lowest.

EU GMP guidelines (Good Manufacturing Practice)

The EU GMP guidelines define threshold values for microbiological contamination and particle concentration in the air. The GMP clean-room classifications A to D (A= highest requirements, D= less strict) are used in the pharmaceutical and life science industry industry, as well as in other sectors (semiconductor, photovoltaic, food products).

Highest requirements for clean-room luminaires

In addition to excellent lighting technology, clean-room luminaires must comply with the following requirements:

- High chemical resistance, especially against cleaning and disinfection agents
- Water-tight and dust-tight on the room side (IP65)
- Very low or no particulate emissions
- Flat surface that prevents particle and germ accumulation and supports simple cleaning
- Biologically resistant materials
- High level of compatibility with various clean-room ceilings

Zumtobel luminaires suitable for clean rooms

The CLEAN ADVANCED and CLEAN SUPREME product groups are suitable for use in clean rooms with an air purity class of 3 to 9 (in accordance with DIN EN ISO 14644-1) and A to D (in accordance with EU GMP guidelines) (Fraunhofer IPA certificate).

Food certification

Standards and guidelines in the food industry

The IFS (International Food Standard) and BRC (British Retail Consortium) are deemed the two most important global standards for food safety. The strict hygiene requirements and specifications aim to guarantee a high level of quality and safety in food production and processing. Certification in accordance with IFS/BRC is paramount for food manufacturers in order to be considered as a potential supplier for commercial enterprises.

IFS Food version 6 lighting requirements

- 4.9.7.1** All working areas shall have adequate lighting.
- 4.9.7.2** All lighting equipment shall be protected by shatter proof covers and installed to minimise the risk of breakage.

BRC version 7 lighting requirements

- 4.4.10** Suitable and sufficient lighting shall be provided for correct operation of processes, inspection of product and effective cleaning.
- 4.4.11** Where they constitute a risk to product, bulbs and strip lights – including those on electric fly-killer devices – shall be adequately protected. Where full protection cannot be provided, alternative management such as wire-mesh screens or monitoring procedures shall be in place.

Guidelines

EU regulation 852/2004 stipulates the application of the HACCP (Hazard Analysis and Critical Control Points) concept rules for all companies active in the food industry. It provides a clearly structured approach to identifying, assessing and eliminating health risks within the framework of food production. Like the food product standards, the HACCP concept aims to increase product safety and quality and provide the consumer with better protection.

Chemical resistance

No material is resistant to all chemicals or other environmental influences. The types of influences and chemicals are very diverse and fill volumes of resistance tables. Both the degree of saturation of the chemical substance and the ambient temperature must be taken into account when assessing potential danger. The exact chemical composition of the influences the luminaire is exposed to should always be clarified with the respective user.

In addition, the degree of saturation of the chemical substance also needs to be taken into account, along with the ambient temperature. Depending on the type and composition of the substance, the chemical reaction can occur at high or low temperatures. Zumtobel consultants will be happy to assist in the event of any uncertainties or to answer any specific questions.

Recommendation according to area of application

	PC	PMMA	CHEMO
Damp locations			
Bake houses	■	■	■
Damp cellars	–	■	■ ■
Fodder kitchens	■	■	■
Large-scale catering establishments	■	■	■
Wet locations			
Beer and wine cellars	■	■	■
Breweries	–	■	■ ■
Wine cellars (using sulphur to steam out barrels)	–	■ ■	■ ■
Damp pump rooms	■	■	■
Meat processing facilities	–	■	■ ■
Electro-plating plants (caution: do not use V2A)	–	■ *	■ *
Conservatories	■	■	■
Cheese dairies	–	■ ■	■ ■
Dairies	–	■	■
Washing bays/car washes (for motor vehicles)	–	■	■
Rooms or areas in bathhouses or laundries	■	■	■
Bathrooms/shower rooms	■	■	■
Thermal spas and brine baths	■	■	■

■ ■ highly recommended ■ suitable – unsuitable

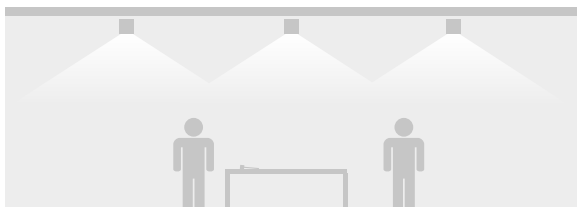
* with plastic closures and special ceiling mounting brackets (on request)

	PC	PMMA	CHEMO
Agricultural premises			
Fodder preparation	■	■	■
Greenhouses	■	■	■
Storage areas/storerooms for hay, straw, fodder, fertilisers	■ ■	■	■
Areas for animal husbandry (stables)	–	■ ■	■
Locations exposed to fire hazards (only the version with an electronic ballast is fire resistant)			
Woodworking	■	■	■
Paper processing	–	■ ■	■
Textile processing plants	–	■ ■	■
Theatre workshops	■	■	■
Drying rooms	■	■	■
Garages	■	■	■
Underground garages	■	■	■
Car parks	■	■	■
Private garages	■	■	■
Vehicle depots	■	■	■
Outdoor facilities			
Facilities on ramps (canopied)	■	■	■
Gateways (canopied)	■	■	■
Canopied railway platforms	■	■	■
Canopied petrol stations	■	■	■
Canopy roofs	■	■	■

Planning principles

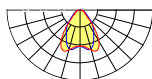
Different light distributions can be specified to suit the type of room, task or lighting goal. The following list gives an overview of the most common light distributions for industrial applications.

Typical light distributions in industry



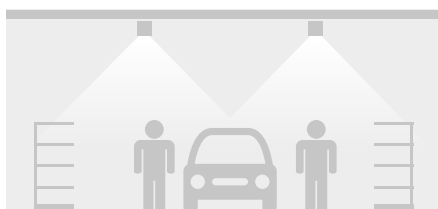
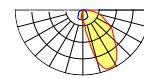
Production areas

- Even, efficient illumination of large surfaces
- Lighting solution works just as well after alterations in the space
- Wide beam or narrow beam, depending on the room height



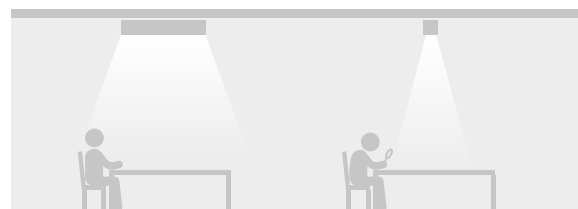
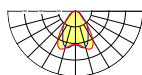
Vertical surfaces

- Intense, even illumination of vertical surfaces (e.g. shelves, machines with lateral visual tasks, large objects such as aircraft or trains, etc.)



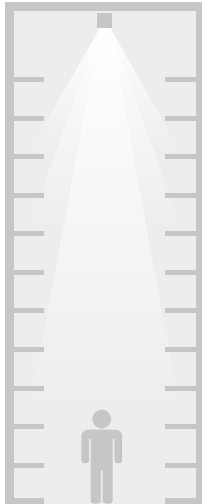
Workspaces with very demanding visual tasks (e.g. automotive industry or precision mechanics)

- Glare-free, even light with high illuminance for undisturbed work at high-precision workplaces



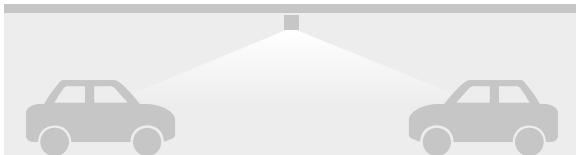
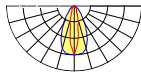
Quality checks/inspection workplaces

- Light has to be precisely adjusted to suit the task at hand in terms of light colour (colour rendering), light direction, amount of light and the position of the lighting
- Additional workplace-related lighting
- Flat, shadowless light
- Different colour temperatures



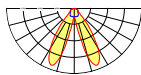
Storage areas

- Even, efficient illumination of large surfaces
- Lighting solution works just as well after alterations in the space
- Wide beam or narrow beam, depending on the room height



Low spaces

- Even illumination of low spaces (e.g. underground garages)
- Additional indirect light share for ceiling illumination creates a pleasant appearance



Checklist for industrial lighting projects

Experience has shown that actual requirements and general conditions are often not fully considered before the lighting is planned. We recommend using this checklist, or something similar, to precisely identify the requirements and therefore find the perfect lighting solution for the project.

General conditions, room height and size

- Ceiling construction
- Reflectance factor
- Window areas, doors, etc.
- Arrangement and material of furnishings
- Positions of lifts, fork-lifts, constructions...
- Usage periods
- Employees (number, age...)

Lighting tasks

- Use of space, circulation area, passages and their flexibility
- Work domains (production process) and the associated lighting quality criteria

Environmental conditions

- Moisture
- Chemical influences
- Dust, vapours, oils
- Cleanliness (hygiene requirements)
- Temperature
- Fire protection, explosion protection

Other

- Normative regulations
- Energy consumption thresholds
- Maximum connected load
- Budget for initial installation
- Maintenance schedule and access

Emergency lighting

Reliable efficiency

Zumtobel offers robust and customised LED safety luminaires for high ceilings – products that have been developed to face the challenges of industry. For example, RESCLITE escape-route luminaires for high ceilings and anti-panic spotlights guarantee reliable orientation from heights of 7 to 20 metres.

The wide range of escape-sign luminaires also includes all-round models for industry. Robust and cost-effective LED luminaires, such as CROSSIGN, are characterised by high resistance, easy assembly and perfect light technology – even at cool temperatures. Adapted to the constant power reduction of LED luminaires, the TÜV-certified eBox complies with all requirements for central and group battery systems in accordance with EN 50171 and can be used in both large and small projects.

Kraiburg Strail GmbH & Co. KG, Tittmoning | DE

Electrical installation: Elektro Erlen & Fellner GmbH, Tittmoning | DE

LED lighting solution: CRAFT high-bay luminaire,
PERLUCE luminaire with higher degree of protection,
MIREL recessed luminaire, Thorn Altis Area floodlight,
Thorn L2L2 road lantern, ONLITE PURESIGN escape-sign luminaire



zgservices.com

The Zumtobel Group Services (ZGS) portfolio includes “Emergency Lighting Systems” services for everything concerning the commissioning and maintenance of emergency escape lighting.



Product recommendation

ONLITE RESCLITE antipanic
ONLITE RESCLITE escape
high ceilings



ONLITE CROSSIGN
escape-sign luminaire



ONLITE central eBox
Central emergency power
supply system



Finance services

NOW: Light that pays for itself.

Today's modern lighting will already be outdated by tomorrow. With our NOW service agreement, we are able to provide you with a constantly up-to-date and properly maintained lighting system. The agreement is not about selling luminaires but about guaranteeing future lighting performance, incorporating factors such as illuminance. You only pay for the on-going operation.

Flexible

Always at the cutting edge of technology

We live in an age where light is subject to fast-paced technological change. The best remedy for outdated lighting is highly flexible solutions and continuous management of the lighting. With Zumtobel Group Services, you have a partner who provides you with a service concept that goes far beyond simply purchasing luminaires.

Hassle-free

Comprehensive, expert service from a competent partner

Efficient light is a strategic milestone for your energy management. Together with our expert team, we plan lighting solutions based on the latest technological standards, provide you with professional installation services, help you to apply for subsidies and grants, monitor the operation of your lighting systems and continuously identify potential for improvements and savings. We take responsibility for all tasks associated with lighting and guarantee practical improvements for the duration of the agreement, covering key aspects such as functionality, illuminance and energy efficiency.

No capital

The best light without investment

With NOW, you do not buy lighting – you receive light as a service. This results in several financial advantages. For a start, you do not have to invest in fixed assets or divert any resources away from the core areas of your business. You select the duration of the agreement, while the monthly rate for the light service is clearly defined in advance. For lighting refurbishments, alongside immediate operational cost savings, there may also be the possibility to apply for subsidies or grants.

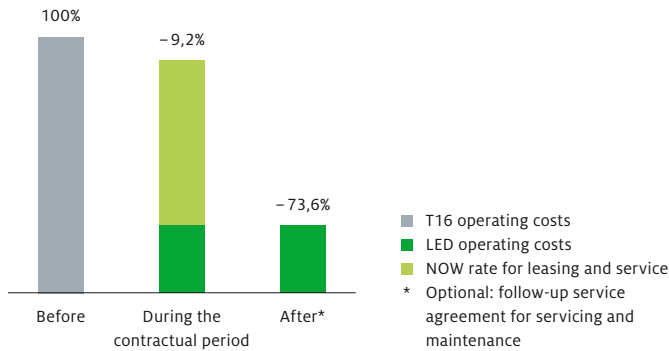


Faigle Kunststoffe GmbH, Hard | AT

LED lighting solution: TECTON continuous-row luminaire, SCUBA moisture-proof luminaire and Thorn AquaForce, MIREL surface-mounted luminaire, Thorn Primata Pro and PopPack continuous-row luminaires

Monthly operating costs

Calculation for a contractual period of 7 years



Energy consumption reduced by 65 per cent

Instead of continuous rows with T16 fluorescent lamps, modern Zumtobel and Thorn LED luminaires are now doing their job at Faigle. As a result, the electricity output has been reduced from 49 to 19 kilowatts and the annual energy consumption for lighting has decreased by 65 per cent. This also means that 60 tonnes of CO₂ will be saved annually.

Guarantee of an average 400 lux

ZGS guarantees an optimal illuminance for the entire contractual period that is significantly higher than the current standards. A required illuminance of 400 lux has been agreed in all areas with multiple shift operation, as well as in mailing rooms and side rooms. All inspections, maintenance work and on-going modernisation are also included.

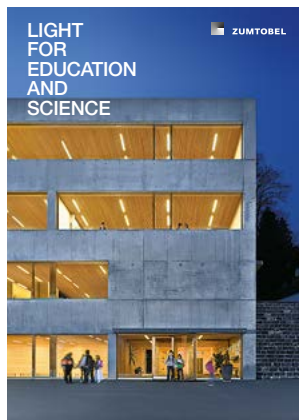


“For me, the well-being of our employees is the top priority. With NOW we were able to improve visual conditions in production halls without capital expenditure. The new luminaires, the associated quality improvements and energy savings – as well as all services – are included for the entire duration of the agreement”.

Jürgen Zech, production manager

Faigle Kunststoffe GmbH (plastics manufacturing), Hard | AT

Zumtobel, a company of the Zumtobel Group, is an internationally leading supplier of integral lighting solutions for professional indoor and outdoor building lighting applications.



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

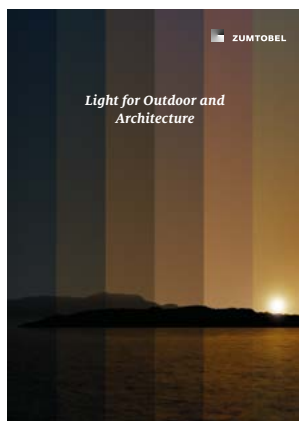
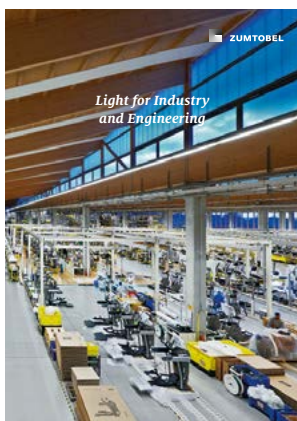
We provide unique customer benefits by integrating technology, design, emotion and energy efficiency. We combine the best possible ergonomic lighting quality for an individual's well-being with the responsible use of energy resources. The company's own sales organisations in twenty countries, as well 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



5
YEAR GUARANTEE

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 in accordance with the terms of guarantee at zumtobel.com/guarantee.

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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.



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



Luminaires with extra protection



Facade, media and outdoor luminaires



Lighting management systems



Emergency lighting

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