

# LIVING LIGHT

ZUMTOBEL GROUP

THORN

TRIDONIC

 ZUMTOBEL

acdc

REISS

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# Editorial



Ulrich Schumacher  
CEO Zumtobel Group

Welcome to the world of light! Light unites technical innovation with a remarkable ability to appeal to our emotions. That's what makes engaging with light such a unique experience. For us, the primary focus of this process is always on people's needs. Light doesn't just give us a sense of security and provide us with guidance, it also boosts our performance. And light has this emotional dimension too – it makes us feel good and brings out the best in buildings, spaces and amenities. Light is communication. Light is adaptable. Light is everywhere. Thanks to the latest technical advances, we can now see many new functions of light that we will be delivering to our customers and, of course, to end users in the future.

With our clearly positioned and complementary Zumtobel, Thorn, acdc and Reiss luminaire brands and our "electronic nerve centre" Tridonic under a

single roof, we have everything it takes to be a thought leader and pacemaker for the international lighting industry.

Our brands' most important assets are their employees. Their expertise and passion for light form the cornerstone of our culture of innovation – a culture anchored in an ongoing exchange of knowledge with our long-standing partners from a variety of disciplines and a firm grasp of our customers' needs.

In a highly competitive market, marked by the technology shift to LEDs and ever shorter innovation cycles and product lifetimes, new business models are more essential than ever. Consequently, in the future we need to see ourselves increasingly as a service provider. To this end it is important for us to leverage synergies within the

Zumtobel Group and establish interdisciplinary structures. This is essential if we are to generate an optimal response to the requirements of our customers, meet the needs of modern society and take specific advantage of the opportunities that the technology shift presents. In this brochure, we have set out to provide you with a comprehensive and accessible overview of what sets the Zumtobel Group apart. I hope you find it makes inspiring reading.

Ulrich Schumacher  
CEO Zumtobel Group

# Zumtobel Group

## Light adds to quality of life

Active in more than 90 countries, the Zumtobel Group is a leading global player offering innovative, high-quality lighting solutions and lighting components. One of the Group's chief aims is to use light to improve people's quality of life. With its many years of experience, the combined expertise of its workforce, ongoing dialogue with its customers, and a unique global network of leading technology partners, lighting and electrical consultants, architects and designers, the Zumtobel Group is a pioneer, setting the pace in the international lighting industry. The Group's multi-brand strategy allows it to provide customers with a comprehensive range of products and services. Its four luminaire brands are marketed by a single sales organisation, enabling customers to benefit from a broad spectrum of products for professional indoor and outdoor lighting, including lighting control systems. In the components sector, through its Tridonic brand the Zumtobel Group applies electronics and software expertise

to create innovative system solutions that incorporate the latest technology trends for control gear, sensors and LED modules.

## A workplace full of opportunity

With a wide-ranging portfolio of products and an open and growth-driven corporate culture, the Zumtobel Group offers attractive career opportunities for the industry's creative minds – from software engineers to ambitious lighting experts. The focus here is on energy efficiency, light quality, smart controls and data management. As a listed company, the Zumtobel Group continues to draw upon its heritage as a family business. The Zumtobel family remains the largest single shareholder with a 35 percent stake, and keeps a careful eye on the Group's long-term success. This close relationship finds expression in many ways, including the Dr. Walter Zumtobel Award – named after the company founder – which promote the corporate values and a culture of innovation.



**1950**  
Dr. Walter Zumtobel establishes "Elektrogeräte und Kunstharzpresswerk W. Zumtobel KG"

**1976**  
The company becomes a stock corporation

**1991**  
Zumtobel Licht GmbH and Tridonic Bauelemente GmbH become independent subgroups

**1999**  
Acquisition of luminaire manufacturer Reiss, Germany

**2001**  
Onset of LED activities: Tridonic launches TALEXX LED modules

**2005**  
Zaha Hadid designs VorteXX Masterpiece for Zumtobel

**2015**  
LED share of revenues reaches 50%

**1928**  
Jules Thorn founds "Electric Lamp Service Company"

**1963**  
First international design award for a Zumtobel product (FER recessed luminaire)

**1980**  
Zumtobel launches world's first luminaire line with indirect-direct illumination

**1991**  
Tridonic launches first generation of digitally dimmable ballasts

**1993/94**  
Acquisition of luminaire manufacturer Staff, Germany

**2000**  
Acquisition of Thorn Lighting Group, UK

**2003**  
Jürg Zumtobel becomes Chairman of the Supervisory Board

**2006**  
Initial public offering (IPO)

**2015**  
Acquisition of acdc lighting, UK

# 71.3 percent of

Tridonic's revenues are generated with new products

IN A 2-YEAR PERIOD, GLOBAL KEY ACCOUNT MANAGEMENT SAW 2,200 STORES FROM A DISCOUNT SUPER-MARKET CHAIN RETROFITTED WITH LEDS. THIS MEANT SUPPLYING 228,000 LED LUMINAIRES TO 24 COUNTRIES.

Today a LED luminaire delivers approximately **140 lm/W**; a fluorescent lamp, around **90 lm/W**

**10,000**  
Thorn LED road lanterns were installed in the City of Copenhagen

# THE ZUMTOBEL GROUP HOLDS 4,295 PATENTS

THE ZUMTOBEL GROUP APPLIED FOR **161 PATENTS** IN A SINGLE YEAR

EVERY YEAR MORE THAN **40 MILLION** LIGHT POINTS FROM TRIDONIC ARE INSTALLED ACROSS THE GLOBE

**CA. 7,000**  
WORLD

**EMPLOYEES**  
WIDE

**CA. 80 MILLION EUROS** ARE SPENT EACH YEAR ON RESEARCH & DEVELOPMENT

TODAY THE LUMINANCE OF AN LED MEASURES **2,000 CANDELA PER CM<sup>2</sup>**; A FLUORESCENT LAMP, **2 CANDELA PER CM<sup>2</sup>**.\*

A single LED driver is made up of **160 COMPONENTS**

**1.8 billion** components are installed per year in the Tridonic plant in Dornbirn

Up to 1,050 **Zumtobel Tecton C** luminaires are produced per shift in the Dornbirn plant

**Ca. 2,200 sales employees worldwide**

LEDS ACCOUNT FOR SOME **60 PERCENT** OF ZUMTOBEL GROUP REVENUES

\*see Lighting know-how, p. 40



# Thorn

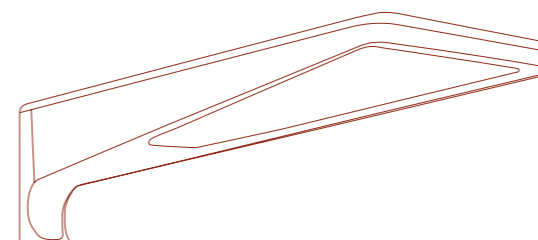
Lighting solutions that offer the perfect balance between energy efficiency, lighting quality and performance.

Thorn's mission is to make great lighting easy for you – offering lighting solutions that are easy to install, operate and maintain. The Thorn brand stands for outstanding optical performance and energy savings without compromising functionality and comfort.

The brand can trace its roots back to the Electric Lamp Service Company, founded in the UK in 1928 by Austrian-born Sir Jules Thorn. Today Thorn is a global brand with a wide-ranging infrastructure offering professional lighting solutions with integrated, smart control systems. The consistently high quality of its products helps make even the largest projects a success. Solutions from Thorn

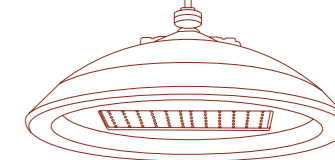
can be found in Wembley Stadium in London, the infrastructure of Charles de Gaulle Airport on the outskirts of Paris, and the street lighting of the City of Copenhagen.

The brand portfolio includes outdoor and indoor lighting for applications in the public and private sectors – office, road, tunnel, sport, education or industry. Thorn products target a wide range of customers worldwide, from wholesalers and electricians to electrical planners and end users.

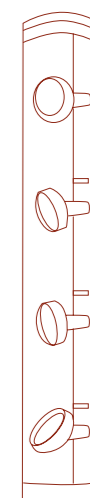


Street lantern Urba

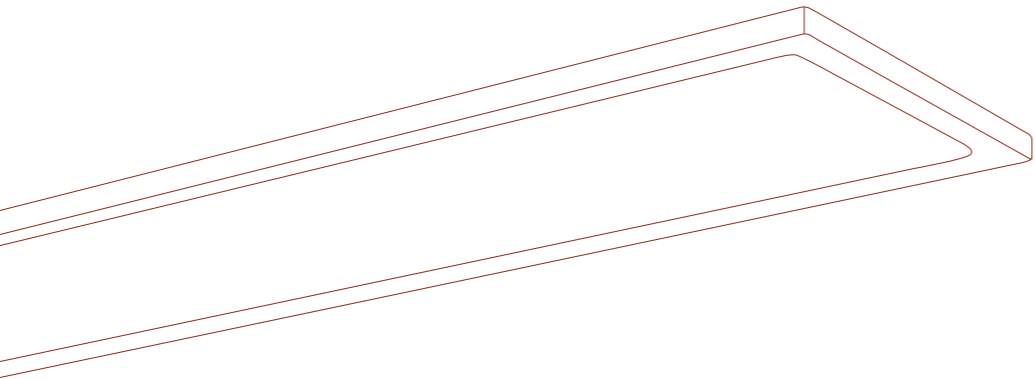
Street lantern Thor



Lighting for roads and cityscape



Cityscape lighting  
Alumet Stage



**Recessed, surface-mounted and suspended luminaires**  
Omega Pro



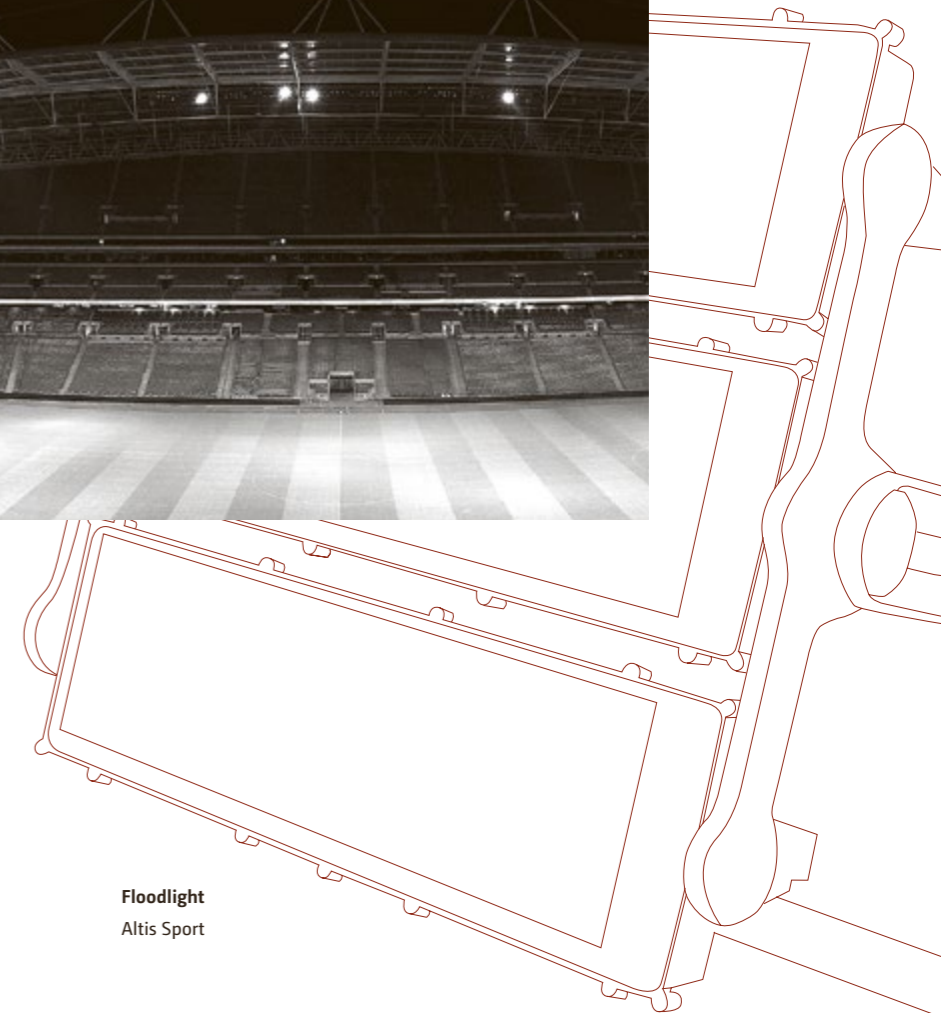
**Lighting for education and offices**



**Lighting for retail and supermarkets**

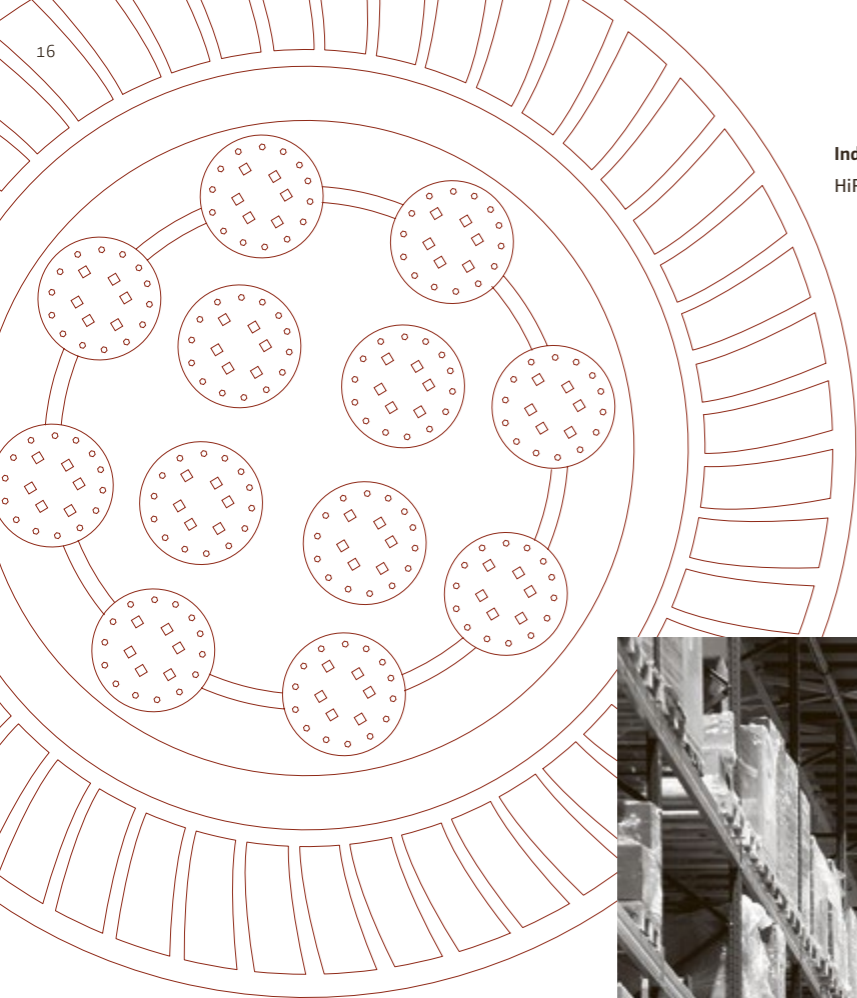


**Lighting for indoor and outdoor sports**  
Wembley Stadium connected by EE, UK



**Floodlight**  
Altis Sport





Industrial luminaire  
HiPak

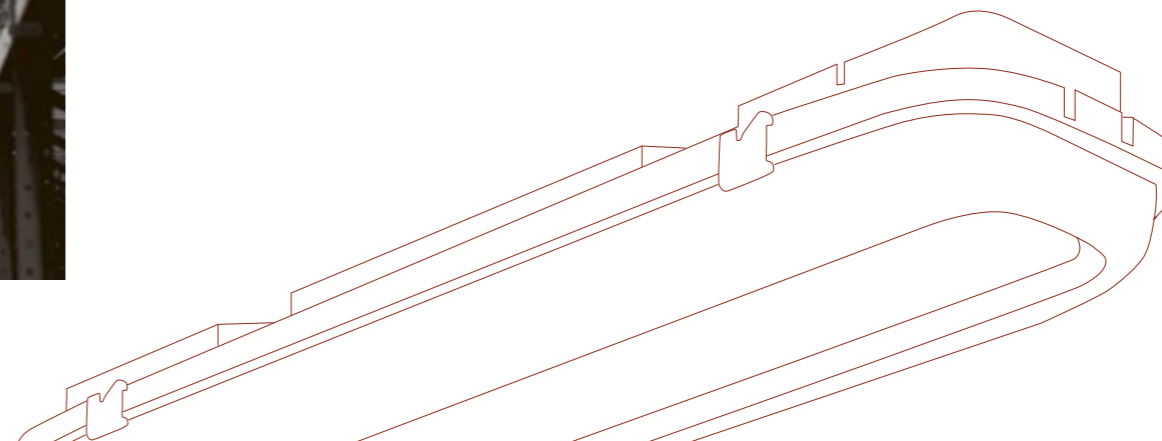


Lighting for industry

Lighting for car parks



Lighting for tunnels



Moisture-proof luminaire  
ForceLED

**Continuous-row lighting system**  
TECTON by Billings Jackson

# Zumtobel

Products that combine outstanding design with innovative technology, always with the aim of using light to thrill and inspire.

The Zumtobel brand stands for holistic lighting solutions that above all enhance people's well-being. The brand's products unite multi-award-winning design with thoughtful integration into the architectural setting. As an innovation leader, Zumtobel offers an exceptional range of premium luminaires and lighting control systems across the full range of applications – office, school, retail, hotel, wellness and healthcare facilities, the arts, urban outdoor lighting, industry, and, most recently, the residential sector.

The development of the product portfolio, which combines outstanding design and innovative technology, is driven by the brand's long-standing collaboration with prominent architects, artists and

lighting designers. When developing its products, Zumtobel takes its lead from the specific needs of the people who will use them. By maintaining this systematic focus on the user and by applying its knowledge of the effects of light on the human body, Zumtobel generates the added value that sets its products apart.

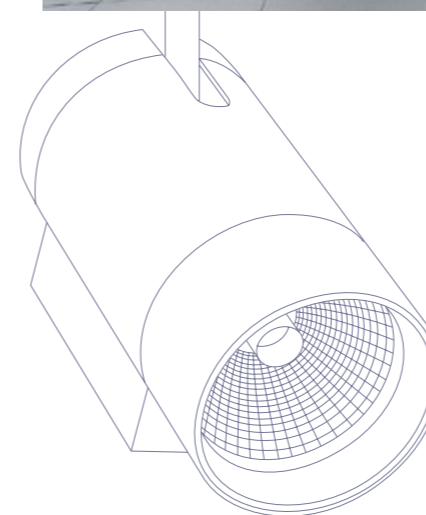
**Lighting for presentation and retail**



McLaren showroom, Vienna, Austria

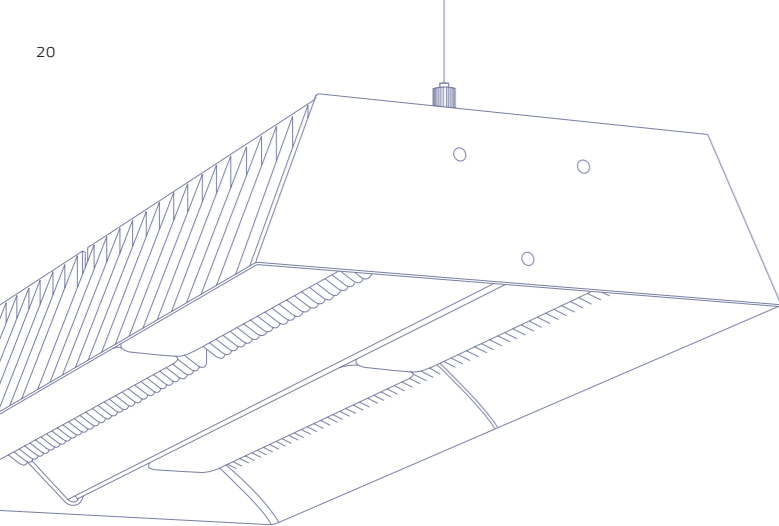


Issey Miyake boutique, Antwerp, Belgium



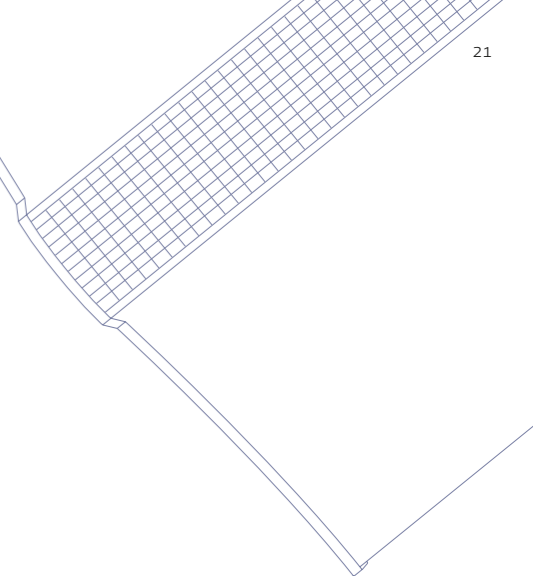
**Spotlight system**  
ARCOS by David Chipperfield





**High-bay luminaire**  
CRAFT by Arup / Stephen Philips

**Recessed and surface-mounted luminaires**  
MELLOW LIGHT by Gensler Architects



**Lighting for industry and engineering**  
Coko-Werk GmbH & Co. KG,  
Bad Salzuflen, Germany



**Lighting for education and science**  
Vienna University of Economics and Business,  
Austria

**Lighting for health and care**  
Paediatric ward of hospital  
in Dornbirn, Austria

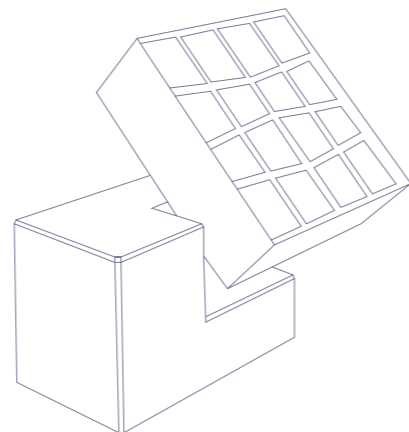


**Lighting for offices and communication**  
Gensler offices, Oakland, USA



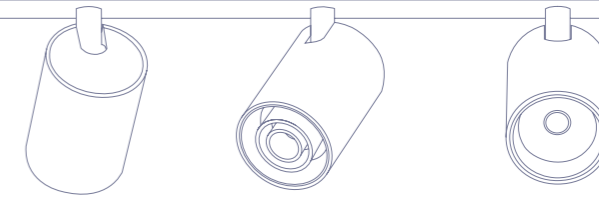


**Lighting for facades and architecture**  
Casinos Austria, Bregenz, Austria



**Architectural outdoor lighting**  
NIGHTSIGHT by UNStudio / Ben van Berkel

**Modular lighting system**  
SUPERSYSTEM



**Lighting for art and culture**  
Museo Jumex, Mexico City



**Lighting for residential spaces**  
Private residence, Cyprus



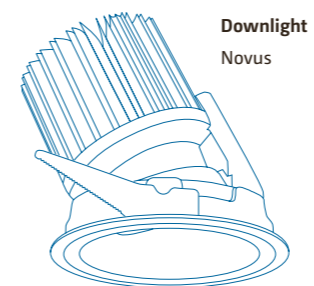
# acdc

With a passion for innovative LED lighting, acdc aspires to revolutionise the lighting industry.

acdc is proud to do things differently. Working closely with the leading lighting designers, the brand develops ground-breaking architectural lighting for facades and lighting solutions for hotels, restaurants and private homes.

acdc follows a unique design approach, with product development centred on LED technology. It brings the passion and technical expertise of its employees to the table in its ongoing dialogue with planners and customers. In this way, acdc has specialised in creating innovative LED lighting with colour change and dynamic light for hotels, boutiques and high-prestige facades.

Established in the UK in 2001, the brand soon made its name with an impressive portfolio of references. Today acdc, which won a Queen's Award for Enterprise in International Trade in 2012, is represented in the UK, the Middle East and Asia with numerous prestigious projects. Examples include the Knightsbridge Estate in London, the Atlantis Palm Hotel in Dubai and the Bitexco Tower in Vietnam. Legendary British retailer Harrods and sports equipment manufacturer Nike have both put their trust in acdc's innovations and service.



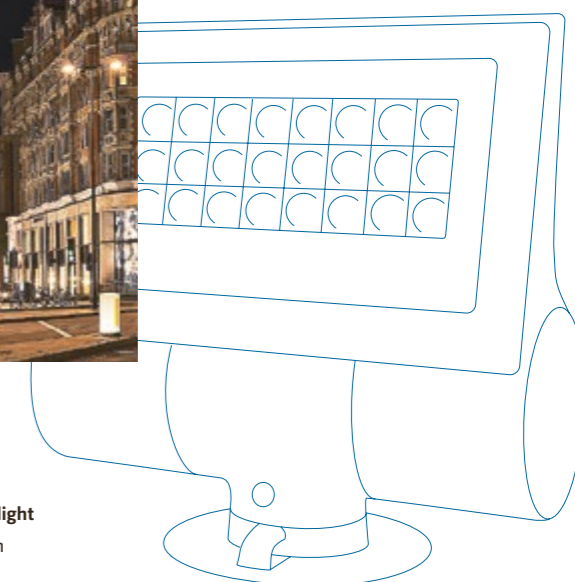
**Downlight**  
Novus

Porsche Braevern, Bellevue, USA



Facade of the Knightsbridge Estate, UK

**Floodlight**  
Fusion



# Reiss

Luminaires with higher protection based on over 90 years' experience in the lighting and plastics industries.

Within the Zumtobel Group portfolio, the Reiss brand stands for a long tradition of producing lighting that complies with the often extreme requirements placed on industrial lighting. Products from this specialist manufacturer boast high resistance, impact resistance, explosion prevention and vandal resistance –at both particularly high and particularly low ambient temperatures. Reiss products are used in exacting applications such as food production, agriculture and port facilities, and on the high seas.

The quality promise “Made by Reiss” dates back to a company founded in 1926 by Joseph Reiss, a plastics engineer. In collaboration with Dr. Walter

Zumtobel, Reiss presented its first moisture-proof luminaires in the 1950s. In 1999, Reiss was integrated into the Zumtobel Group as an independent brand.

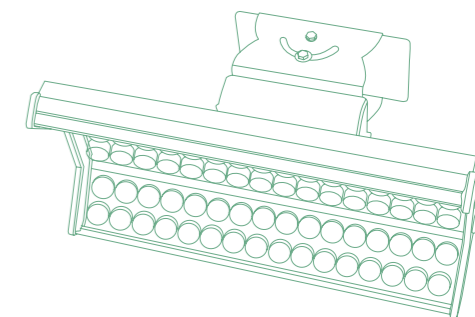
Reiss recently began marketing its products through the Zumtobel Group's global sales network, rounding out the lighting group's extensive product range with luminaires for extreme application areas.



RVC vandal resistant surface-mounted luminaires



Lighting for special requirements



High-bay luminaires RHF



# Tridonic

The Tridonic think tank creates innovative technologies for connected light, smart lighting controls and complete LED lighting systems for the global market.

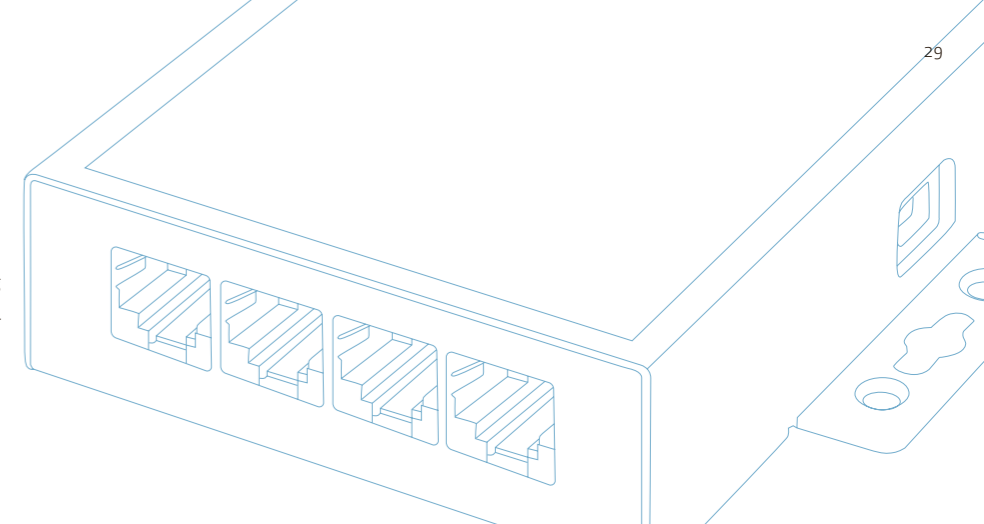
Curiosity and a passion for innovation have made the Tridonic brand the technological nerve centre of the Zumtobel Group. Producing smart and energy-efficient LED modules, LED drivers, sensors and software, Tridonic delivers the innovative components that help keep the Group at the cutting edge of lighting. Since 1991 Tridonic has been serving the OEM market as an independent brand, generating some 80 percent of its revenues with luminaire manufacturers around the globe.

The in-depth expertise of its employees enables Tridonic to create component systems that not only offer superior functionality and cost-effectiveness, but are also reliable, safe, efficient and sustainable. In developing its portfolio of products,

Tridonic continues to benefit from close collaboration with the other Group brands – Thorn, Zumtobel, acdc and Reiss – building on their extensive knowledge of user requirements for advanced lighting solutions.

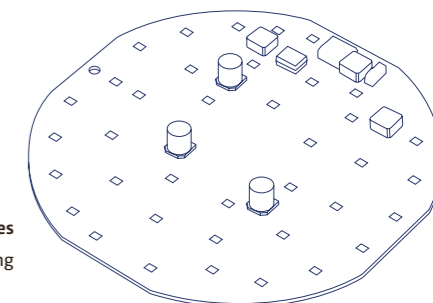
Ninety-five percent of Tridonic's R&D projects are devoted to developing new LED systems and technologies for connected light. Looking ahead to the future of light in the Internet of Things, Tridonic's comprehensive portfolio of hardware and software makes it the perfect partner.

connecDIM Gateway lighting control system for luxCONTROL



Lighting control for mobile devices

TALEXXmodules for ceiling and wall lighting



# Sales network



With a global reach that keeps us close to the needs of our customers, the Zumtobel Group sales network extends through 90 countries. Our customers benefit from our multi-brand approach and broad-based portfolio of products and services.

## 2,200 sales employees

The Zumtobel Group is active around the globe, offering a strong local presence on the ground. We are represented by sales offices and partners in more than 90 countries. About 2,200 sales employees, which equates to around a third of our total workforce, work in field sales and the back office to provide our customers with the best possible on-site service – every day.

## All brands from a single source...

The product portfolios of the Thorn, Zumtobel, acdc and Reiss luminaire brands are marketed by a single sales organisation. This means our customers can draw on a single source for an especially broad range of products and comprehensive

services. Our sales team focuses on offering the best possible solution to each and every customer. Their expert knowledge allows them to assess the customer's requirements and select a tailored solution from our portfolio of brands and services.

## ...aimed at different customer groups

Because our sales organisation is aimed at meeting the needs of different customer groups, we can provide in-depth and targeted service on the ground. Luminaire sales are grouped into three distribution channels. In the "Specification" channel, specialised sales advisors work with architects, lighting designers and electrical planners from start to finish of a building project, contributing their expertise to the development of specifications for suitable lighting solutions. In the



"End-User" channel, another team of specialists provides services targeting end-users in the industrial, commercial and municipal sectors, as well as private customers. In the "Trade" channel, numerous sales employees cater to the needs of wholesalers and electricians in all of the Zumtobel Group's seven sales regions.

## ...and supported by Group headquarters

Customers who are rolling out lighting projects across markets or who are themselves global players are served by specialists from Group headquarters in Dornbirn, Austria. This applies to international planning offices as well as large industrial and commercial customers and global wholesale partners. The central departments act as points of contact

for the customers and work with their regional colleagues to ensure the optimal coordination of large-scale projects or global lighting-solution rollouts for companies with multiple branches.

## Sales of innovative lighting components

In the lighting components segment, the Tridonic brand also has its own sales organisation. This caters to the needs of luminaire manufacturers around the world, with whom we often enjoy partner-like relationships spanning decades.



# Services

The future of the lighting industry lies in providing services for everyone, from companies to private customers.



One of the current NOW! projects is a lighting solution being provided for the globally active aluminium manufacturer SAPA at its facility in Nenzing, Austria.

## NOW! Light as a service

NOW! is the Zumtobel Group's new business model. Companies receive new lighting solutions without the initial outlay, instead paying a monthly lighting fee. This way they get to enjoy optimised lighting levels, efficient lighting solutions, and reliable functionalities. Professional, one-stop service and flexible service agreements allow them to put responsibility for their lighting into the experienced hands of the Zumtobel Group. Since the model enables companies to implement projects quickly and without upfront investment, they can easily roll out NOW! in multiple locations. New, energy-efficient lighting leads to an immediate reduction in energy costs that is felt from the moment the lighting is installed.

## Atelier of Light

The Zumtobel Group's Atelier of Light team brings its expertise to bear on the development of exceptional lighting solutions – be it in the context of international projects in the business sector or for private customers.

Working closely with architects and specialist planning bureaus, the experts at the Atelier of Light develop project-specific luminaires and lighting solutions, breaking new ground in terms of lighting technology, materials and design. The hallmark of an integrated lighting solution is the optimal interplay between the widest variety of luminaires, a lighting management system and innovative data services – perfectly geared to the respective application. Project support and coordination services complete the service offering.

It's an approach that gives rise to not only trailblazing products but also an intimate familiarity with the latest trends, which then also find their way into the company's standard portfolio. In addition, the Atelier of Light provides the Group's business partners and sales staff with software tools developed in-house with which to design, visualise and compute lighting solutions. With their in-depth knowledge of light, aesthetics and applications, the Atelier of Light team also play their part in providing vocational training and continuing professional development for the Group's employees.



Städel Museum, Frankfurt, Germany



Lighting for residential spaces

In a recent development, the Zumtobel Group now also offers private customers the chance to benefit from its experience in the professional lighting field. A multi-brand product portfolio spanning indoor and outdoor lighting is available from licensed planning and installation partners. They offer consulting, lighting design and installation in the home, while the Atelier of Light handles project management and coordination. In this way, the lighting experts ensure that private customers too can benefit from optimal lighting conditions in their homes.



# Quality & Management systems

As a company that aspires to innovation leadership in the lighting industry, we are committed to outstanding quality in every segment of our business. From the careful selection of suppliers and compliance with international production standards, this principle extends all the way to our professional after-sales service.



## **Continuous development of quality standards**

All of our production facilities are certified in line with ISO 9001, and the certification process serves as the basis for the continuous development of our quality standards.

## **Professional processes**

The improvement of processes and products is professionally managed through our continuous improvement process. We apply Lean Six Sigma methodology to systematically minimise potential sources of error. Our lean management experts optimise processes and cut back activities that do not create value.

## **Standards and regulations**

The Zumtobel Group guarantees that all our products comply with the applicable standards and

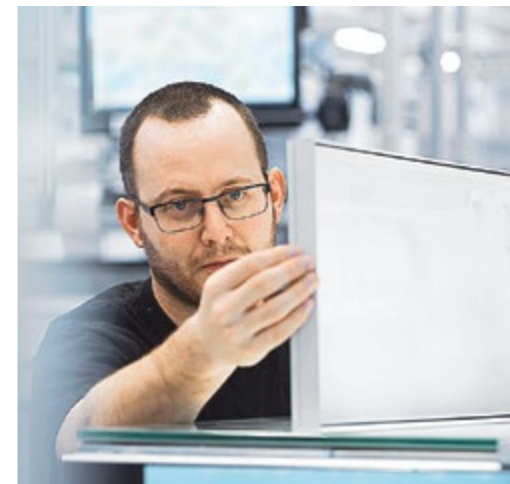
regulations. This includes in particular standards for lighting applications, international electrical engineering standards such as IEC, EN, and UL (USA), as well as legal requirements such as the CE certificate. In addition, we conform to voluntary certifications such as ENEC.

## **Testing in light laboratories**

We test our products in internationally accredited light laboratories to ensure compliance with norms and standards as well as quality and safety criteria.

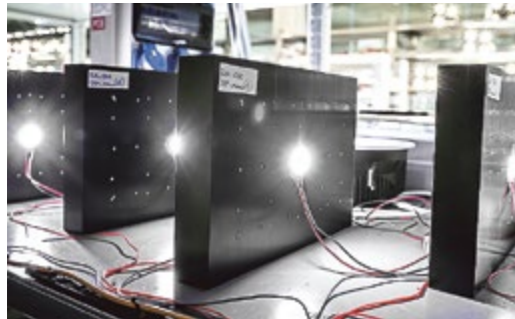
## **Guarantee**

Zumtobel Group offers different guarantee levels for its products, for further details please contact your regional sales partner.





# Technology & Smart light



Innovation driven by superior technology is a core element of the Zumtobel Group. The Group leverages the synergies that result from collaboration between its brands in the luminaire and component segments, and applies a platform strategy in its product development activities. Around the globe, 602 employees work in R&D; their annual budget of some 80 million euros adds up to more than six percent of total expenditure.



## Light in the Internet of Things

One focal point of the Group's research is the question of what role light can play in smart interaction at the human machine interface. In the Internet of Things (IoT) lighting becomes information infrastructure. In the past, information about the people within a defined space was simply collected, allowing energy to be saved by reactively adjusting illumination or temperature levels.

Now, however, the data also flow in the opposite direction, with light conveying information – for instance helping shoppers with smartphones find products in a store or delivering the data required to facilitate more efficient operation of an office building or an industrial enterprise. Luminaires, sensors and devices come together to form an IoT ecosystem.



# Light & Sustainability

## Production-related measures

In the Zumtobel Group, sustainability is assigned top priority. Responsibility for people and their environment begins with sustainable working conditions, supply chains and production methods. This includes systematic supplier audits, the efficient and careful use of resources in accordance with Lean Six Sigma methods, and maximum reduction of emissions and waste throughout the product life cycle. Our employees receive training

in environmental protection, and our production processes conform with the ISO 14001 and ISO 50001 environmental management and energy management standards.

## Energy-efficient products

When it comes to sustainability, we also empower our customers. Energy-efficient products and smart lighting control systems make a valuable contribution to resource conservation. Our customers don't



just benefit from good light quality, but also from greater energy efficiency – which means lower energy costs – and the long service life of our products.

## Energy savings by numbers

The scale of the energy-saving potential across the entire Group can be seen in the figures that were last compiled in the 2014/15 financial year, which put total energy savings at 2,364,239 megawatt

hours (previous year: 1,100,710 MWh). These energy savings correspond to the annual power consumption of 788,080 two-person households (previous year: 366,903). Calculated in terms of the CO<sub>2</sub> emissions of a coal-fired power plant, the energy saved by the Zumtobel Group in the 2014/2015 financial year equates to 2,033,246 tonnes of CO<sub>2</sub>.



# About light

## Binning

The nature of the production process means that minor deviations occur in the colour and brightness of individual light-emitting diodes (LEDs). Binning is the process of classifying the LEDs into narrowly defined groups with a similar illumination intensity. It ensures that LED modules are fitted with LEDs of identical quality so that the luminaire has a uniform lighting effect.

## Colour rendering

The colour rendering index (Ra or CRI) is a measure of how naturally and faithfully colours are revealed by the light from a luminaire/light source. Sunlight has the maximum Ra value of 100, while high quality LED luminaires achieve an index of Ra 90 and above.

## Human Centric Lighting (HCL)

Light not only enables vision and influences mood, but also has a biological action that has a direct impact on human physiology. Human centric lighting designs put the focus on people, providing features such as dynamic lighting moods and adaptability to individual biorhythms.

## Internet of Things/Connected Light

The Internet of Things refers to the smart networking of all the objects in our daily lives at work and at home which, in the future, will not only collect data but also make intelligent use of it. Lighting solutions for buildings or entire cities will use this

approach to create a network under sensor control which has huge potential for increasing efficiency and sustainability while ensuring maximum convenience and safety for people.

## Luminance

This is a measure of light intensity, measured in candelas (cd) per unit area (m<sup>2</sup>). Luminance (abbreviation L) is the only basic photometric quantity which is perceived by the eye. It determines the visible light or perceived brightness of a surface.

## Luminaire luminous efficacy

This is a measure of a luminaire's economic viability. Stated in lumens per watt (lm/W), it is the ratio of the luminous flux emitted by the luminaire to its total power consumption.

## Luminous efficacy

Similarly to luminaire luminous efficacy, this is a measure of a light source's efficiency. The more lumens (lm) per watt (W) a light source generates, the greater is the efficiency with which it converts the power it uses into light. By way of comparison, the luminous efficacy of an LED is 100 to 140 lm/W, while the value for a halogen lamp is 20 lm/W and that for a fluorescent lamp 80 to 100 lm/W. In LED luminaires, ensuring an optimum balance between light source, optical system and ballast, as well as light guidance and ambient conditions is key to evaluating actual efficiency.

## Luminous perceived colour and colour temperature

Luminous perceived colour is the colour of the light seen by the eye. It is measured quantitatively as colour temperature in Kelvin and is broken down into three groups: warm white (< 3,300 K), neutral white (3,300 K to 5,300 K) and daylight white (> 5,300 K). Measurement is referenced to the temperature at which a blackbody (Planck emitter) reaches the same colour (by heating) as the light source to be measured (most similar colour temperature).

## Lighting management

Over every 24 hour period, there is a correct light for each time of day and each activity. Smart lighting management results in lighting solutions that are in harmony with the human body clock, which means that they support a healthy sleep-wake cycle. Using daylight sensors, presence detectors, blind controllers, dynamic lighting moods and an intuitive control system, lighting management maximises user convenience while simultaneously cutting energy consumption by up to 75 percent and thereby minimising ongoing operating costs.

## Light pollution

Industrialisation and urbanisation result in increasing nocturnal light levels. Not only the light indirectly emitted by artificial light sources, but also the light reflected by the atmosphere have a

negative impact on the environment, for example disrupting the natural circadian rhythm of nocturnal animals and migratory birds. Excessive, indiscriminate lighting also increases CO<sub>2</sub> emissions. Lighting design thus has a responsibility not only for aesthetics and safety, but also for the sustainable use of resources in harmony with nature.

## Tunable White

Depending on the material they are made of and their colour, objects can only come into their own when illuminated with light of the correct colour temperature. The Tunable White technology developed by Zumtobel and Tridonic enables a luminaire to render variable colour temperatures at a constant luminous flux, mainly over a range from warm white (2,700 K) to cold white (6,500 K).

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