Light for industry and engineering
Logistics
In modern business, the importance of logistics is growing steadily. The quantity and quality of goods and services present ever new challenges for businesses. The distances are becoming greater, the delivery times shorter and increasingly more products require cool storage. Logistics halls in many cases have immense cubatures and there is also no daylight in frozen food stores. The energy requirement for the lighting is accordingly high. The most effective means for reduction of the running operating costs is an efficient lighting solution that minimises both the power consumption as well as the maintenance costs. The added value is based on the advantages of innovative luminaires and intelligent lighting control: LED luminaires open up a new dimension of longevity, reliability and efficiency – also and particularly for low ambient temperatures. Higher illuminance levels and improved glare control enhance the employees’ productivity and helps avoid errors. Flexible lighting solutions offer perfect light for the most varied visual tasks, not only at the time of installation, but optimally for the future changes and extensions.

Zumtobel. The Light.
Cover picture: Lidl logistics centre (cold store –18 °C), Wundschuh bei Graz | AT
Lighting project design: Adenbeck Gebäudetechnik, Wels | AT
Electrical installation: Licht Loidl, Lafnitz | AT
Lighting solution: LED high-bay luminaire CRAFT
| LOGISTICS | Maintenance | Long service life  
| Maintenance | Protection against the accumulation of dust | 6–9 |
| Energy efficiency | Low power consumption | 10–13 |
| Lighting quality | Higher illuminance levels | 14–17 |
| Flexibility | Flexible through installation on trunking units | 18–21 |
| Logistics sample solution | High-bay warehouse with contrast sensor | 22–23 |
| COLD STORE LOGISTICS | Light for fresh produce zones, refrigerated warehouses and frozen food stores | 24–25 |
| Maintenance | Long service life in cool environment | 26–27 |
| Energy efficiency | Less cooling effort due to lower heat load | 28–29 |
| Performance | Full light immediately | 30–31 |
| Emergency lighting | Reliable efficiency | 32–33 |
| Logistics / cold store logistics sample solutions | High-bay warehouse / cold store | 34–35 |
| International rollout | A global network with close ties | 36–37 |
| Customer management | Full service all over the world | 38 |
| Light as a service | Never again buy another luminaire! | 39 |
Maintenance

Zumtobel’s product range features particularly low-maintenance units that have a long service life and meet logistics requirements. Many luminaires in high bays are difficult to access, maintenance and frequent relamping are therefore very expensive. Reducing the need for maintenance has the added advantage of less frequent disruptions of working processes. With an average service life of 50,000 hours and a guaranteed end-of-life luminous flux in excess of 70 per cent, LED luminaires are virtually maintenance free for long periods of time. LED light source, batten and optics form a unit. Due to the compact design, cleaning is easy too.

• LEDs achieve a long service life
• Intelligent thermal management guarantees a long life
• Compact and durable product design minimises maintenance effort

Wilh. Wülfing GmbH & Co. KG, Borken | DE
Lighting solution: CRAFT M Wide Beam high-bay LED luminaires, management via DIMLITE multifunctional control unit, control via conventional momentary-action switches
Durable LED luminaires are almost maintenance-free.

The replacement of faulty lamps, ballasts or complete luminaires in partly inaccessible places, costs a lot of money and takes a lot of time and staff effort. In the case of LED luminaires, regularly replacing the light sources is no longer necessary, even after 50,000 operating hours the LED will still achieve a luminous flux of at least 85 to 90 per cent of the initial level. On the other hand, a HIT lamp will fall below 60 per cent of its initial level already after a few months. Accordingly, the light source must be replaced more frequently.

“Again and again, we need to exchange defective or old light sources.”

Recommended products

- TECTON LED | Continuous-row luminaire | 90% luminous flux after 50,000 operating hours
- CRAFT M | High-bay LED luminaire | 85 to 90% luminous flux after 50,000 operating hours
“The environment is full of dust, and technically we would have to clean the luminaires regularly. In the case of high rooms, this is hardly possible.”

**Stack effect prevents dust from accumulating.**

A layer of dust on the luminaire surfaces has an insulating effect, possibly causing heated air to accumulate in the luminaire. Excessive temperatures reduce the luminous flux of the luminaire and may cause total failure of the luminaire. However, regular cleaning is difficult in the case of high rooms or during operation. The example of the CRAFT high-bay luminaire shows very well how innovative surface and product design can help in this respect: the luminaire is not closed completely, but allows for air to pass through next to each optical unit. As hot air will rise, the stack effect will blow the dirt out of the luminaire. Any heavier particles will fall directly through. All surfaces are slanted, so that hardly any dirt will settle. The stack effect provides two major benefits: the LEDs receive better cooling, and the luminous flux of the luminaires can achieve new record levels.

**Recommended products**

- **SCUBA LED | Moisture-proof diffuser luminaire**
- **CRAFT M | High-bay LED luminaire | 85 to 90% luminous flux after 50,000 operating hours**
Energy requirements in industry are often extremely high due to long operating and production hours, this also applies to lighting: high-bay lighting requires large lumen packages. Constantly rising energy prices provide an additional incentive to save energy. Even the choice of light source has a huge impact on energy consumption. Advanced LEDs are used in situations where they can play to their strengths – an individually manageable and controllable light source that has a long service life and is largely maintenance-free. Intelligent lighting management achieves the greatest possible energy efficiency. Daylight is used as a natural source of light and is only supplemented by artificial lighting as required. Increasing automation is creating more and more zones and areas where people do not work at all or which are visited only for occasional inspections. Such periods with limited lighting requirements are useful for the corridor function in order to reduce operating time and accordingly reduce power consumption.

- LED allows for a new dimension of efficiency that is increased even further through targeted lighting control of the lens technology incorporated
- Thanks to the corridor function, the light is turned off when rooms or zones are not used
- The availability of daylight offers the option to reduce artificial lighting

Gebrüder Weiss GmbH, Lauterach | AT
Architects logistics: Albrecht Bereiter
Architekten ZT K6, Dornbirn | AT
Architects headquarters: Cucrowicz Nachbaur
Architekten ZT GmbH, Bregenz | AT
Electrical consultants: Ingenieurbüro Hiebeler + Mathis OG, Hörbranz | AT
Lighting solution: TECTON LED continuous-row lighting system, SLOTLIGHT, CHIARO LED, CAPA free-standing luminaires, PANOS infinity downlights, CPS emergency lighting system with ECOSIGN and RESCLITE, LUMXATE LITENET lighting management
“Electricity is getting ever more expensive. How can I reduce energy costs for lighting?”

**Efficient LED technology provides for long-term reduction of energy consumption.**

Many halls were put into operation 15 to 20 years ago and are in need of refurbishment. The technologies used are obsolete, the luminaires are not efficient and provide too little light. In logistics applications, light accounts for a very high proportion of operating costs. At least 20 per cent is accounted for by lighting. Modern LED technology is clearly more efficient than the high-pressure lamps or fluorescent lamps frequently used in industry. No end of this development is in sight yet; the light output of LED luminaires will continue to increase with power input decreasing at the same time. Additionally, light that is controlled in a targeted manner through lenses does not require any reflectors and is not subject to the associated loss of power. A meaningful comparison of LED luminaires can be made on the basis of actual luminaire efficiency, with losses due to reflection and transmission of optics being accounted for already.

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**Recommended products**

- **TECTON BASIC LED** | Continuous-row luminaire | 85% luminous flux after 50,000 operating hours
- **CRAFT M** | High-bay LED luminaire | 85 to 90% luminous flux after 50,000 operating hours

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**Development of white LED**

- Halogen lamp
- Fluorescent lamp
- Sodium vapour lamp
- LED
In logistics halls, there are very many storage areas that are permanently illuminated in spite of being used irregularly. In these areas, the corridor function can help reduce energy consumption substantially. Presence detectors will detect when a staff member enters the room or drives into an area covered by sensors. Immediately, the luminaire group concerned will be switched to full operating mode. After a programmable period, brightness will be dimmed down to a minimum level again. In this way, safety is ensured at all times.

The corridor function reduces the periods of use of the lighting, thus cutting electricity costs.

In logistics halls, there are very many storage areas that are permanently illuminated in spite of being used irregularly. In these areas, the corridor function can help reduce energy consumption substantially. Presence detectors will detect when a staff member enters the room or drives into an area covered by sensors. Immediately, the luminaire group concerned will be switched to full operating mode. After a programmable period, brightness will be dimmed down to a minimum level again. In this way, safety is ensured at all times.

“The light is on permanently, in spite of the fact that the relevant area is occupied only occasionally.”

Recommended products

| ATIVO | Multisensor | LITECOM | Lighting management |

Energy efficiency

Full amount of light only in case of anyone being present

Energy saving thanks to flexible illuminance and presence detection

Energy saving thanks to flexible illuminance, presence detection and daylight linking
Lighting strongly influences employees’ performance, making it possible to cope effortlessly with visual tasks and is therefore the first consideration when it comes to lighting design. An adequate lighting level and good glare control are required in order to be able to concentrate on the work at hand and remain motivated. In addition, high illuminance has a positive impact on people’s commitment, on error rates and the risk of accidents. The requirements in terms of lighting quality vary according to the visual task. Adequate optics selectively direct the light onto the visual task area. Thus, for instance, luminaires with a narrow-beam optics illuminate the vertical shelves of a high-bay storage facility uniformly and efficiently, whilst also reducing illuminance levels.

- Both for high-bay storage facilities and large-area warehouses, Zumtobel provides luminaires with sophisticated light distribution
- Innovative lens technologies and luminaire design provide for glare limitation in spite of high luminance levels

Lagermax, Villach | AT
Electrical consultants: Elcon Hebenstreit & Dörre, Klagenfurt | AT
Electrical installations: ETK Elektro Tischner und Klein, Villach | AT
Lighting solution: TECTON LED continuous-row system, FD 1000 LED downlight, SCUBA LED moisture-proof luminaire, PERLUCE LED moisture-proof luminaire, ONLITE eBox central battery, CROSSIGN LED escape-sign luminaire, RESCLITE LED escape route luminaires
Frequently, maintenance intervals are not observed or the lighting system is a mix of HID luminaires that has grown over many years. Both situations will lead to illuminance levels that are much too low and not compliant with applicable standards. In addition, the use of rooms, and their layout, is changed repeatedly, for example additional shelves being set up which will lead to insufficient light quantities. Switching to an LED lighting system includes the possibility to achieve higher illuminance levels. Moreover, the high lumen packages are maintained in the long term, for the luminous flux of LED luminaires drops much more slowly than in the case of conventional light sources.

Higher illuminance levels facilitate work. Perfect light distribution minimises the safety risk.

“It is too dark in our picking and storage areas. The illuminance levels are not in conformity with applicable standards.”

Recommended products
TECTON MPO LED | Continuous-row luminaire 90 % luminous flux after 50 000 operating hours
ATIVO | Multisensor

Energy saving using flexible illuminance
- Manufacture 500 lx
- Delivery 400 lx
- Storage 300 lx

Energy saving thanks to flexible illuminance and presence detection
- Manufacture
- Delivery
- Storage

Energy saving thanks to flexible illuminance, presence detection and daylight linking
- Daylight
- Manufacture
- Delivery
- Storage

Standard values for lighting of workplaces
*“Lighting of indoor workplaces”, EN 12464-1 (June 2011)*

<table>
<thead>
<tr>
<th>Area</th>
<th>( \bar{E}_m )</th>
<th>UGR (_L)</th>
<th>( R_a )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Store rooms, frozen food stores</td>
<td>100</td>
<td>25</td>
<td>60</td>
</tr>
<tr>
<td>Store and stockrooms</td>
<td>300</td>
<td>25</td>
<td>60</td>
</tr>
<tr>
<td>Dispatch packing handling areas</td>
<td>150</td>
<td>22</td>
<td>60</td>
</tr>
<tr>
<td>Storage rack areas</td>
<td>150</td>
<td>22</td>
<td>80</td>
</tr>
<tr>
<td>Gangways: unmanned</td>
<td>20</td>
<td>—</td>
<td>40</td>
</tr>
<tr>
<td>Gangways: manned</td>
<td>150</td>
<td>22</td>
<td>60</td>
</tr>
<tr>
<td>Control stations</td>
<td>150</td>
<td>22</td>
<td>80</td>
</tr>
<tr>
<td>Front of (high bay) racks</td>
<td>200</td>
<td>—</td>
<td>60</td>
</tr>
</tbody>
</table>
“Our luminaires dazzle the forklift drivers during loading and unloading of the high shelves.”

Newly developed lens technologies provide for glare control and make the luminaires efficient.

During loading and unloading of high shelves, it may well happen that the driver of the forklift truck directly looks into the lighting. If excessive luminance levels cause glare, shelves may be hard to identify, which may cause mistakes. The new split-lens technology directs the light specifically into the side areas. Thereby, the central light pressure reduces and the luminaire appears significantly less glaring. Various distribution characteristics for adaptation to the spatial conditions can be realised with the split-lens concept. An elliptical beam pattern has been developed especially for logistics applications in rooms with high ceilings. Thus shelf surfaces are illuminated uniformly, and in spite of wide distances between light points, bright, uniform illumination of circulation areas is achieved.
In ever higher halls, ever more diverse and especially more sophisticated visual tasks have to be performed. Manual work, mechanical production and storage are accommodated under one roof. On the one hand, therefore, high illuminance levels and and high lighting quality in selective areas must be produced from great heights. On the other hand, uniformly high halls offer a possibility to quickly and flexibly respond to changes by arranging the furniture. Utmost flexibility in lighting is offered by a trunking system combined with lighting control. In this way, luminaires can be rearranged quickly and individually adjusted at the push of a button.

- Flexible solutions facilitate the simple extension and rearrangement of luminaires
- LED optics optimise light distribution without changing appearance

Texel fruit cooperative, Naturns | IT
Design and construction management: Dr. Ing. Siegfried Pohl, Latsch | IT
Electrical consultants: M. & N. Plan Consulting, Burgstall | IT
Electrical installations: Elektro Gafriller, Barbian | IT
Lighting solution: CRAFT M Wide Beam high-bay LED luminaires, SCUBA LED moisture-proof luminaires for emergency and passageway lighting, TECTON trunking, ONLITE CPS central battery, daylight-based control system
A pre-wired trunking system allows you to rearrange luminaires quickly and easily.

If storage capacity is too low, without any options to extend the same within the area, shelves are frequently topped up. However, often these new shelf surfaces are not ideally illuminated or stacking takes place at mounting height. Production bays are frequently used as storage areas, or production takes place in former warehouses. Continuous-row solutions facilitate any subsequent rearrangements or extensions. If installed on trunking, the position of continuous-row luminaires or high-bay luminaires can be adjusted quickly. In case of changes to the work layout, a luminaire with suitable beam pattern is simply hooked in – either replacing or supplementing existing luminaires. With the TECTON continuous-row system, installation is child’s play, because the trunking has already been pre-wired. Installing the luminaires on trunking is also easy and done quickly even in high rooms.

Recommended products

<table>
<thead>
<tr>
<th>CHIAPRO II LED</th>
<th>Moisture-proof diffuser luminaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECTON adapter for CRAFT</td>
<td>High-bay LED luminaire</td>
</tr>
</tbody>
</table>

Apart from TECTON continuous-row luminaires (LED, T16, T26), high-bay LED luminaires, emergency luminaires, spotlights or decorative lighting modules with a suitable TECTON adapter are offered to be installed on TECTON trunking.

“We need to change or extend our logistic areas frequently. How can we make our lighting fit for the future?”

High-bay luminaires installed on trunking provide for flexibility for the storage of goods at FRIGEL AG in Switzerland. Additional mounting slots allow for the trunking itself to be rearranged flexibly.
“Our hall has several differently used areas. I want suitable lighting in a uniform design.”

In spite of various different beam patterns, a consistent look is produced.

To optimise light distribution in line with the respective use and spatial situation, Zumtobel relies on a precisely matched combination of LED light points and lens technologies. And the good thing is: the luminaires look identical, only the lenses change the beam pattern. A special, elliptical beam pattern has been developed for logistics applications in rooms with high ceilings. In this way, vertical shelf surfaces and circulation areas can be illuminated properly and in a uniform manner even with wide spacings between light points. For general, wide-area lighting, wide-angle light distribution is required. In case of the CRAFT high-bay LED luminaire, the beam pattern is even square, so that no overlaps or dark spots are created in the hall.

Recommended products

TECTON LED | Continuous-row luminaire

CRAFT S | LED high-bay luminaire |
85 to 90% luminous flux after 50'000 operating hours
The innovative ATIVO multisensor integrates available daylight, keeps the defined light levels consistent and detects moving objects. The greatest strength lies in the almost free design of rectangular detection zones, up to five per sensor. Subsequent changes to room use can be quickly and efficiently implemented. High-bay sensors have been developed for room heights up to 20 metres; a robust IP64 case gives it the necessary resilience for industry.

Sensor system that adapts perfectly
The ATIVO contrast sensor divides the rectangular detection zone into a grid of 17 x 11 cells. Based on these small units, zones can be defined in almost any form and arrangement – in accordance with the local use and the room layout.

### Energy saving *

<table>
<thead>
<tr>
<th></th>
<th>ATIVO</th>
<th>PIR sensors</th>
<th>Without sensor system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy saving</td>
<td>68%</td>
<td>35%</td>
<td>0%</td>
</tr>
</tbody>
</table>

### Key calculation data

<table>
<thead>
<tr>
<th>Area: 10 x 20 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height of the hall: 10 m</td>
</tr>
</tbody>
</table>

**30 CRAFT high-bay luminaires**

- Mounting height: 9 m
- Luminous flux: 12 520 lm

**Hall plan**

- Warehouse A: 300 Lux
- Warehouse B: 300 Lux
- Corridor: 400 Lux
- Production C: 500 Lux
- Production D: 950 Lux

<table>
<thead>
<tr>
<th></th>
<th>ATIVO</th>
<th>PIR sensors</th>
<th>Without sensor system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One-off initial costs</td>
<td>803.–</td>
<td>945.–</td>
<td>–</td>
</tr>
<tr>
<td>Energy costs/year</td>
<td>421.–</td>
<td>843.–</td>
<td>1304.–</td>
</tr>
<tr>
<td>Layout charge</td>
<td>120.–</td>
<td>420.–</td>
<td>–</td>
</tr>
<tr>
<td>Costs over 5 years</td>
<td>3028.–</td>
<td>5581.–</td>
<td>6520.–</td>
</tr>
<tr>
<td>Energy saving</td>
<td>88%</td>
<td>35%</td>
<td>0%</td>
</tr>
<tr>
<td>Total cost saving</td>
<td>54%</td>
<td>14%</td>
<td>0%</td>
</tr>
</tbody>
</table>

*[5-year term]*
Comparison:

**Conventional:**
7 PIR sensors (passive infrared)
- Detection range dependent on installation site
- Usually only imprecise demarcation due to mechanical shading

**With ATIVO contrast sensors:**
1 ATIVO sensor
- Significantly lower installation costs
- Up to 50% more energy saving through presence and daylight integration
- Maximum flexibility when changing room layout or use

**Layout change**
1 ATIVO sensor
- No installation effort
- Zones are redefined using software
- Maximum flexibility
Cold store logistics
Light for fresh produce zones, refrigerated warehouses and frozen food stores
With the constantly growing requirements of the consumers for food, the number of products that must be cooled is also increasing – from the production to the distribution centres to the supermarket. Low ambient temperatures present great challenges for the lighting that systems with conventional lamps only overcome to a limited extent. However, high-quality LED solutions deliver their best at low temperatures: They are powerful, long-lasting and efficient. Furthermore, maintenance-free and easy to install products are able to throttle both the running operating costs as well as personnel costs.

BÄKO Weser-Emst-Mitte eG (fresh produce 4°C), Oldenburg | DE
Electrical installer Detlef Coldewey GmbH, Westerstede | DE
Lighting solution: LED high-bay luminaire CRAFT M, moisture-proof luminaire SCUBA LED
“Every maintenance task is difficult for this coldness – conventional lamps fail much too quickly.”
Difficult conditions make maintenance in the cold store logistics extremely expensive. The maintenance time in the cold store is limited to approx. 15 minutes, then the installer must warm up again. Therefore every maintenance task costs a lot of time and money.

The lamp replacement is not necessary for a LED solution. High-quality LED luminaires still provide 85 to 90 percent of the original luminous flux after 50,000 operating hours. At low temperatures, the initial luminous flux even declines more slowly. However, luminaires with fluorescent lamps react sensitively to cold ambient temperatures: If the luminaires remain switched on round the clock due to their difficulties for starting/ignition, the lamps must be replaced at short intervals. However, frequent switching on and off to shorten the operating times and save electricity also does little to help as each start process in the cold weakens the lamp. There is an additional shortcoming with the widespread use of magnetic ballasts which the cold does in fact not stress but which do not provide the advantages of a modern solution.

High minus temperatures also present a challenge to us as people. Assembly and maintenance work is limited to short time units. The benefits of easy assembly are twofold here: lightweight and pre-assembled luminaires that do not have to be opened are installed quickly. LED lamps that do not fail also do not have to be replaced.

- LED luminaires live even longer at minus temperatures than at average room temperatures
- Compact product design enables fast and uncomplicated assembly – particularly at low temperatures

High minus temperatures also present a challenge to us as people. Assembly and maintenance work is limited to short time units. The benefits of easy assembly are twofold here: lightweight and pre-assembled luminaires that do not have to be opened are installed quickly. LED lamps that do not fail also do not have to be replaced.

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Maintenance costs trend of a cold store at –18 °C and 24-hour luminaire operation

* Lamp replacement and cleaning
“The heat emission of the luminaires puts additional load on our cooling system.”
Efficient LED luminaires with low power consumption generate little heat and thus reduce the cooling cost. The reduced electricity consumption for lighting and cooling optimises the operating costs.

The high energy efficiency of LED luminaires pays for itself twice in frozen food stores: In comparison with lighting using conventional lamps, an LED solution needs significantly less electricity and thus also minimises the load for the cooling system at the same time. The investment in an energy-efficient LED lighting solution can be amortised within a very short time due to the low thermal load alone.

Thermal load of different luminaires with similar luminaire luminous flux

<table>
<thead>
<tr>
<th>Luminaire Type</th>
<th>Thermal Load</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>T26 moisture-proof luminaire</td>
<td>214 W (13,400 lm)</td>
<td>-90%</td>
</tr>
<tr>
<td>HIE high-bay luminaire</td>
<td>150 W (10,000 lm)</td>
<td>-92%</td>
</tr>
<tr>
<td>LED high-bay luminaire</td>
<td>104 W (12,800 lm)</td>
<td>-92%</td>
</tr>
</tbody>
</table>

Recommended products

- **CRAFT M | High-bay LED luminaire | can be used until –25°C**
- **SCUBA XT LED | Moisture-proof diffuser luminaire | can be used until –35°C**

SPAR Österr. Warenhandels-Aktiengesellschaft (fresh produce 4°C), Maria Saal | AT
General planning and project management: GPM Ropac & Partner GmbH, Villach | AT
Electrical planner: IB Hartl & Co KG, Klagenfurt | AT
Lighting solution: TECTON LED, SCUBA LED, PST sensor control (corridor function)
“On account of the low temperature, our fluorescent lamps must be operating around the clock.”
• LED luminaires can be switched on easily even at low temperatures and open up the possibility of specific light control.
• LED luminaires also guarantee a constant high luminous flux at minus temperatures

Cold ambient temperatures of down to −40 °C bring conventional lamps to their performance limit: At low temperatures, fluorescent lamps start poorly or not at all. Both fluorescent lamps as well as metal halide lamps also only build up the full luminous flux slowly and are usually operated around the clock due to these problems. On the other hand, LEDs have 100% light immediately, also at minus temperatures, and as a result make the use of light control possible.

Also: Where fluorescent lamps need expensive accessories to still produce enough light at minus temperatures, the LED shows its best side. The cooler the environment, the higher the luminous flux increases.

Luminous flux curve depending on ambient temperature
In contrast to other lamps, the luminous flux of the LED increases at minus temperatures.
Emergency lighting
Reliable efficiency

In line with the challenges of logistics applications, Zumtobel offers customised emergency LED luminaires for high ceilings. For instance, RESCLITE “high ceilings” escape route luminaires and anti-panic spotlights guarantee reliable orientation from heights of 7 to 20 meters.

The wide range of escape sign luminaires also includes allround models for industrial applications. Rugged and affordable LED luminaires such as CROSSIGN are characterised by high strength, easy installation and perfect lighting technology – also at cool temperatures. Matching the continuous power reduction of LED luminaires, the TÜV-certified eBox meets all requirements for central and group battery systems under EN 50171 and can be used in very small as well as in large-scale projects.

Recommended products
RESCLITE escape | high ceilings
RESCLITE antipanic | high ceilings
ONLITE CROSSIGN | escape sign luminaire
ONLITE central eBox | central emergency power supply system
Aveve Logistikzentrum, Wilsele | BE
Electrical installations: Belloy Elektrotechniek BVBA, Sint Katelijne Waver | BE
Lighting solution: TECTON LED continuous-row system with PST presence detectors, MELLOW LIGHT V and LIGHT FIELDS recessed LED luminaires, PERLUCE luminaires with extra protection, MIRAL/MIREL surface-mounted luminaires, ONDARIA circular opal luminaires, CREDOUS downlights, SCUBA moisture-proof luminaires, ONLITE RESCLITE emergency luminaires, SQUARESIGN escape sign luminaires, LUXMATE LITENET lighting management system
Logistics sample solution
High-bay storage facility

In an area of 1200 square meters, goods are stored in high-bay storage facilities in this 15 m high sample hall. Daylight enters the hall through the windows at one side and through skylights. Before refurbishment, the hall was illuminated with HIE reflector luminaires. A comparison with a lighting solution using the TECTON T16 continuous-row luminaire as well as an LED lighting solution using CRAFT Narrow Beam luminaires and DALI daylight automation clearly shows the potential of an innovative lighting solution.

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### Light source comparison

<table>
<thead>
<tr>
<th>Light source</th>
<th>HIE high-bay luminaire</th>
<th>T16 continuous-row luminaire</th>
<th>CRAFT LED 840 L660 PC NB LDO with LUXMATE TLS DALI lighting control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed load</td>
<td>400 W</td>
<td>108 W</td>
<td>196 W</td>
</tr>
<tr>
<td>Number of luminaires</td>
<td>25 off</td>
<td>70 off</td>
<td>20 off</td>
</tr>
<tr>
<td>Total connected load</td>
<td>10000 W</td>
<td>7560 W</td>
<td>3920 W</td>
</tr>
<tr>
<td>Luminous flux</td>
<td>26000 lm</td>
<td>8600 lm</td>
<td>25200 lm</td>
</tr>
<tr>
<td>Luminaire efficiency</td>
<td>51 lm/W</td>
<td>81 lm/W</td>
<td>129 lm/W</td>
</tr>
</tbody>
</table>

### Benefits

- Low total installed load
- Low installed load
- Dimmable
- Daylight integration
- Optic for high-bay racking

### Disadvantages

- High energy consumption
- High maintenance
- Low efficiency
- No daylight integration
- Not dimmable

---

### CO₂ emissions over service life (20 years)

- HIE high-bay luminaire
- T16 continuous-row luminaire
- CRAFT with LUXMATE TLS DALI

### Development of total costs over service life (20 years)

- HIE high-bay luminaire
- T16 continuous-row luminaire
- CRAFT with LUXMATE TLS DALI

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Cold store logistics sample solution
Frozen food store

Products are stored at –18°C in the 12 metres high cold store, however the temperature at the ceiling is down to –32°C. The 810 square metres hall has no windows; the luminaires are switched on around the clock. The hall was illuminated with HIE reflective lamps before the renovation; T26 moisture-proof luminaires were also discussed as possible alternative. An LED solution using CRAFT narrow beam luminaires and presence control brings the greatest benefits. This lighting solution significantly reduces the electricity costs even if – as is this project design example – the reduced cooling load is not included in the calculation.

<table>
<thead>
<tr>
<th>Light source</th>
<th>HIE high-bay luminaire (existing)</th>
<th>T26 moisture-proof luminaire</th>
<th>CRAFT M NB with presence detector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed load</td>
<td>HIE</td>
<td>T26</td>
<td>LED</td>
</tr>
<tr>
<td>Number of luminaires</td>
<td>400 W</td>
<td>2 x 2/58 W (with conventional ballast and electric starter)</td>
<td>98 W</td>
</tr>
<tr>
<td>Total connected load</td>
<td>8440 W</td>
<td>3340 W</td>
<td>2450 W</td>
</tr>
<tr>
<td>Luminous flux</td>
<td>20,300 lm</td>
<td>8400 lm</td>
<td>12,600 lm</td>
</tr>
<tr>
<td>Luminaire efficiency</td>
<td>51 lm/W</td>
<td>79 lm/W</td>
<td>129 lm/W</td>
</tr>
</tbody>
</table>

Benefits
- Low connected load
- Low maintenance cost
- High energy efficiency
- High energy consumption
- Can be dimmed using presence detector with corridor function
- Optics for high-bay warehouse
- Slow decline of luminous flux

Disadvantages
- High energy consumption
- High maintenance cost
- Uneven illumination of the rack aisle
- High heat input
- Not dimmable
- High energy consumption
- High maintenance cost
- Significantly reduced luminaire luminous flux
- Dimming with additional cost

Total connected load = thermal load of luminaires

Development of total costs over service life (20 years)
International rollout
A global network with close ties

In the case of international brands, products, shop interior fitting and lighting are all underpinned by a single distinctive concept. Only an experienced partner like Zumtobel can ensure that there are no hitches in a global rollout.

As a global player, Zumtobel has 100 company-owned business units and commercial agencies in more than 70 countries. We always seek to be close to the customer even when customers are based in less industrially developed nations. Zumtobel is not just at home in Europe and the USA, it also has sales offices and representative offices in emerging markets such as Russia, Turkey, the Middle East, India, China and Southeast Asia. Zumtobel is capable of deploying a lighting solution all over the world, regardless whether this involves installing lighting equipment in large numbers of shops or extensive or complicated shop projects. There is always only one single point of contact: a central Key Account Team takes care of worldwide procurement and project organisation. This takes place in close contact with local organisations, so that particular country-specific features and circumstances can be taken into account at all times. In this way, we can save time and accelerate processes.

Continuity of supply around the globe is guaranteed by 8 production facilities; we deliver the right quantity at the agreed time. Short transport routes consume fewer resources and reduce costs.
Zumtobel/Thorn production facilities

Sales locations
- Dornbirn, AT
- Lemgo, DE
- Spennymoor, UK
- Les Andelys, FR
- Auckland, NZ
- Guangzhou, CN
- Sydney, AU
For Zumtobel, being close to our customers is extremely important. Zumtobel’s first advantage is worldwide onsite customer care. Through a partnership with Zumtobel, customers who operate on an international scale can make sure that every one of their locations reaps the benefit of Zumtobel’s entire range of products and services. Support throughout all the phases of a project is another plus. This ensures that a comprehensive service package is available, from design and delivery right through to maintenance.

**Concept and design**
Zumtobel works out an appropriate lighting solution that is finely tuned to cater for the customer’s needs and the target groups that it wishes to address. Technology and lighting quality meet at the highest level.

**Delivery management**
Experienced Zumtobel specialists take care of international rollouts. All logistics are managed from a central location – with just-in-time deliveries to any location in the world.

**Installation and commissioning (NOW!)**
Manufacturer-trained electrical installers with extensive product knowledge guarantee fast, professional installation. Systems are commissioned by expert employees.

**All inclusive: guarantee and maintenance**
With Zumtobel, everything is available on request from a single supplier. Reliable maintenance and an extended guarantee for the installed lighting installation ensure that the lighting solution remains fully functional and its value is maintained.

**Financing**
A lighting solution that is in line with the budget often involves financing. Zumtobel can offer a tailor-made solution at all levels.
Light as a service
Never again buy another luminaire!

In the context of NOW! we offer you light as a service. You will get the best light to perform your tasks, without having to buy any luminaires or worry about their operation. Your benefits compared to traditional luminaire purchase at a glance:

Immediate profit
Cost savings are higher than the NOW! instalments.

No investment
Fixed, monthly NOW! instalment covers all costs.

No risk
All-inclusive guarantee and maintenance services.

No expenditure on upgrading
Turnkey project is completed by a team of experts.

Practical example:
NOW! in industry

€26760 of savings over a period of 8 years

Old lighting system
€31666 operating costs/year
100 luminaires, HQL with conventional ballast 400 W
480 W installed load/luminaire
48 kW installed load/total

New lighting solution
€16225 operating costs/year
100 luminaires, CRAFT 280 W
280 W installed load/luminaire
28 kW installed load/total

31666 €
annual operating costs

-3345 €
immediate annual profit

12099€
annual NOW! rate

16225€
annual operating costs

Cost trend

Today
NOW! agreement
more than 8 years

Key calculation data: operating hours: 4500 hours/year (2-shift), electricity rate: 0.12 €/kWh, 2% increase per year
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

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

**Lighting and sustainability**

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

**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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