ZUMTOBEL

LIGHT FOR DATA CENTRES

EFFICIENT, SUSTAINABLE AND SECURE LIGHTING
FOR CRITICAL INFRASTRUCTURE

INNOVATIVE, SUSTAINABLE AND SECURE

Safe, reliable operation and energy efficiency are two of the biggest challenges presented by the increasing demand for data centres worldwide. However, Internet users are largely unaware of how many resources these centres consume and the vulnerability of this global, omnipresent digital service – unlike hardware, your personal, invisible data traffic and the data clouds are intangible.

Data centres use more than 1% of the world's electricity, due at least in part to additional Internet use during the lockdown phase in spring 2020 (+ 40%), for example. Despite a doubling in user numbers since 2010, the increase in power consumption has been more gradual, thanks to improved technologies (source: IEA Report Data Center).

The PUE (power usage effectiveness) metric, which determines the ratio between the total power consumption of a data centre and that of its actual digital infrastructure, is an important quality factor in this positive development.

An efficient lighting solution will take this metric into account. The right combination of luminaires and controls, optimised service intervals or service packages and monitoring ensures continuous, fault-free operation. However, light also supports people in their daily work and in extreme situations such as during a cyber blackout, which is now just as media-relevant as a large-scale power failure.

About Zumtobel
Part of the Zumtobel Group, Zumtobel is a leading international provider of holistic lighting solutions, delivering professional lighting for buildings both indoors and outdoors. For over 70 years we have been developing innovative and individual lighting solutions and are constantly guided by a unique design approach.
Our goal is to improve people's quality of life through light, by offering an extensive range of high-quality luminaires and lighting control systems. Combining these with comprehensive consultations and services.

SUSTAINABILITY AND ENERGY EFFICIENCY

Efficiency and sustainability are key challenges in data centres, in terms of power consumption and processes. The percentage of total energy consumption used for lighting is in the single digits. In purely mathematical terms, this figure may appear low at first glance. Nevertheless, when it comes to the ideal PUE value, no stone should be left unturned in the attempt to increase energy efficiency. This key figure should be as close to a value of 1.0 as possible and shows how much of the total energy used in a data centre is actually converted into computing power. Lighting can play a role in this.
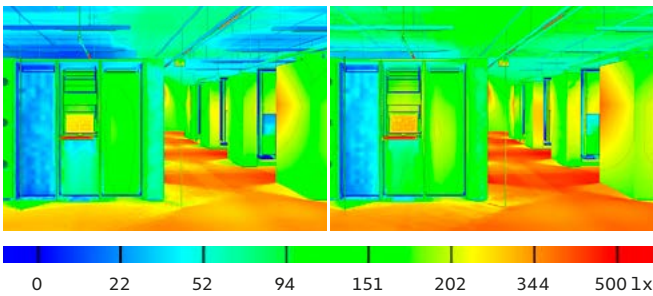
SUSTAINABILITY

Intelligent developments and the use of innovative technologies result in the continuous improvement in our portfolio's sustainability. At luminaire product level, the overall material and environmental performance during the product life cycle, from development to disposal, is documented in an EPD (environmental product declaration). These environmental declarations can be used as a basis for environmental building assessments such as BREEAM, LEED or WELL Building.

z.lighting/en/group/sustainability

LIGHTING MANAGEMENT

Efficient luminaires with LED technology, lighting control systems for new and renovated buildings combined with presence and daylight linking control systems mean maximum energy efficiency when operating a lighting system. Sustainability goals are also met by lighting management that satisfies the highest ergonomic and architectural requirements.

| | 0 | 22 | 52 | 94 | 151 | 202 | 344 | 500 lx |

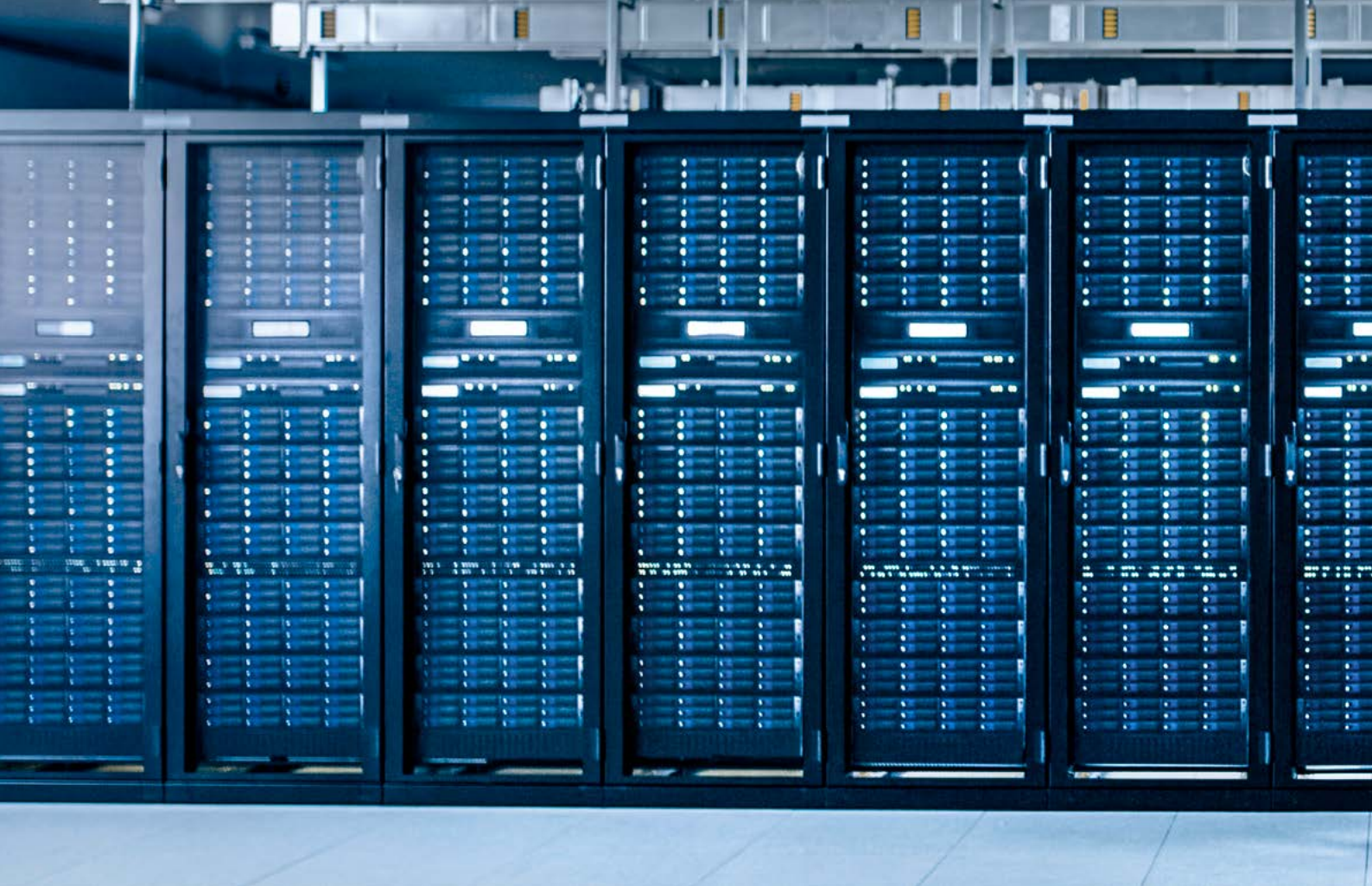| Equipment	Black	White
Reflectance value	4%	85%
Number of luminaires	104	65
Connected load	4.31 W/m²	2.70 W/m²
Illuminance		
Horizontal	Average 506 lx	600 lx
Vertical	Average 232 lx	418 lx
Power usage effectiveness (PUE)*		Improved

* The PUE value compares the total energy consumed in the
  data centre with the energy consumption of the computers.

Surfaces and reflection

Black server racks and other IT components absorb a lot of light, therefore hindering optimum light distribution in the data hall, as well as driving up power consumption (see image on the left). However, white devices reflect the light more effectively. Projections show that data centres with white equipment require 37 per cent fewer luminaires, which in turn means a reduction in investment costs and power consumption (see image on the right).

See the difference between brighter and darker infrastructure for yourself in a VR experience:
discover.zumtobelgroup.com/data-centre

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CRITICAL INFRASTRUCTURE.
EXACTING REQUIREMENTS.

Data centres are considered critical infrastructure, making their reliable, uninterrupted operation a top priority. High temperatures and the prevention of dust particle build-up therefore pose special challenges for the lighting.

TEMPERATURE RESISTANCE

High temperatures caused by server operation in the data centre place extreme demands on the lighting. Temperatures on the processors can reach up to 80 °C. This requires additional energy expenditure for ventilation and air conditioning for the devices and rooms. LED lights that have been specially developed and approved for extreme temperatures guarantee safe, efficient and cost-effective operation.
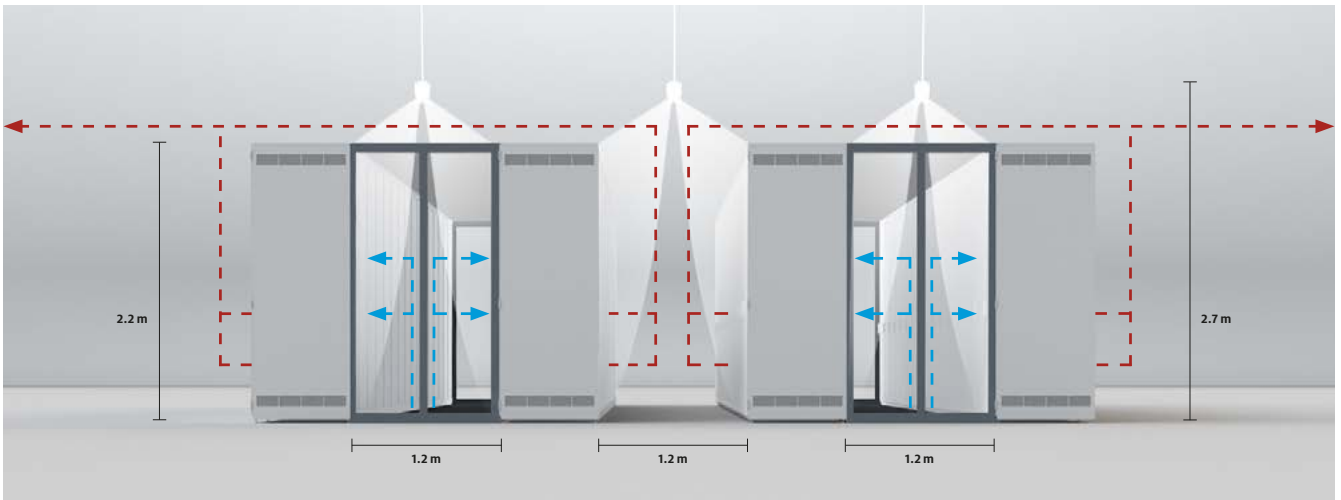
HIGH DEGREE OF PROTECTION

The resistance of the luminiare surfaces facilitate the maintenance and cleaning processes. Whilst, IPX4 (ingress protection) enables the use of water based fire suppressions systems.
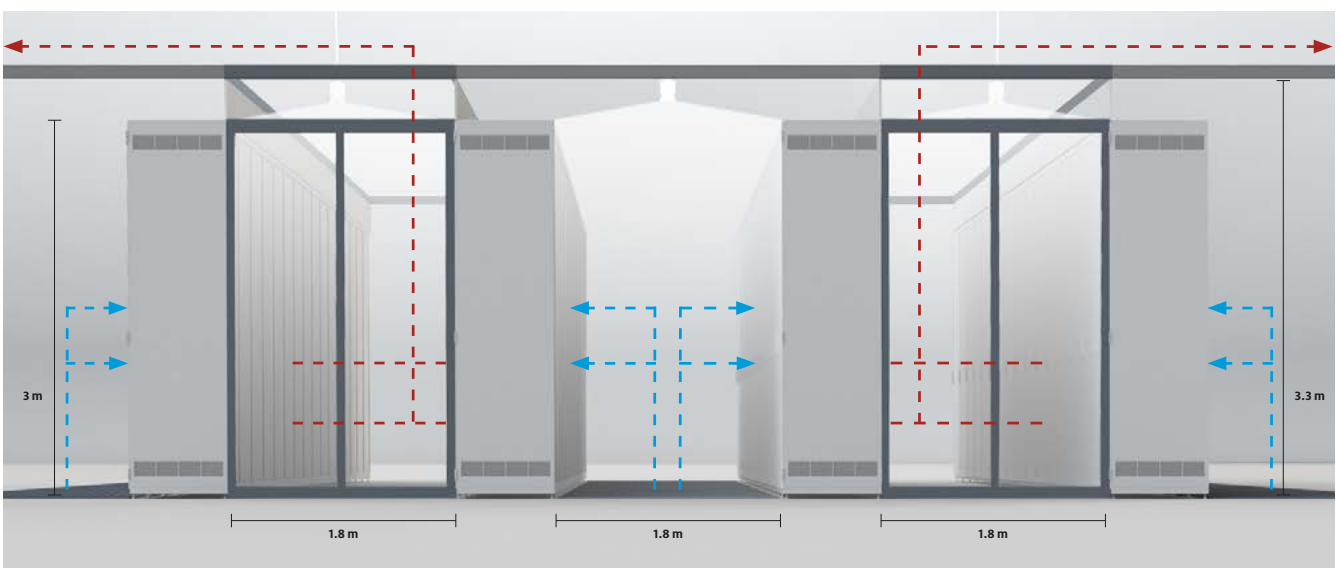
-40°C |||||||||| |||||||||||||| +70°C

Luminaire	Temperature range	Degree of protection
CRAFT II plus	–40°C to +70°C	IP66 (IPX9)
CRAFT II performance	–20°C to +65°C	IP66
AMPHIBIA PC*	–40°C to +54°C	IP66
CLEAN II industry	–20°C to +50°C	IP65/50
TECTON IP / TECTON	–20°C to +45°C	IP64/IP54/IP20

*Reduced luminous flux at high temperatures

2.2 m   1.2 m   1.2 m   1.2 m   2.7 m

**Cold aisle containment
with Shelf Beam luminaires**

Intensive and uniform illumination
of the vertical rack fronts in rooms
with low or suspended ceilings

3 m   1.8 m   1.8 m   1.8 m   3.3 m

**Hot aisle containment
with Wide Beam luminaires**

Uniform illumination of the aisles – whether
cool or hot – as well as good legibility for
vertically integrated data displays

LIGHT FOR PEOPLE.
EXCEEDING THE STANDARDS.

Light in data centres is more than a cost factor. Light contributes significantly to a conducive working environment. This involves not only the IT personnel being able to see data displays or labels, light also has an influence on emotional health as part of the ambience as well as on biological processes. Well-being, attentiveness and alertness are goals that make a valuable contribution to the working environment as part of the overall approach to light quality.

VISUAL LIGHT QUALITY

Minimum standards for light in workplaces are set out in EN 12464-1 Lighting of workplaces – indoor workplaces. This standard also serves as a basis for planning. Key factors here are glare and illuminances with uniformity requirements in the task area. This is planned horizontally and vertically when working on the data centre servers. The universal TECTON continuous-row lighting system and its incomparable split-lens technology ensure precise and efficient light distribution, whether symmetrical or asymmetrical, wide-beam or narrow-beam. Reduced glare means efficient and balanced light distribution on the horizontal surfaces or vertically in the racks.
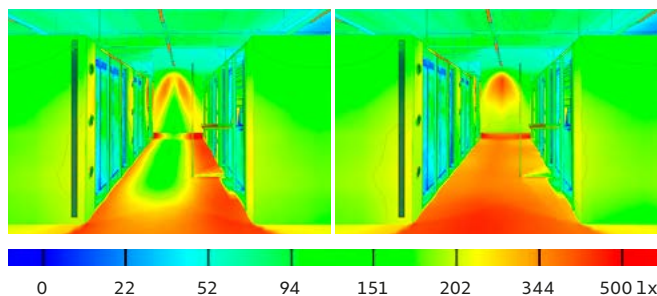
EMOTIONAL LIGHT QUALITY

Together with the room environment, light also supports people emotionally. Light takes on the task of specifically accentuating or punctuating tasks, objects and spaces. Considered design focused on cylindrical illuminance modelling enhances facial recognition, supporting video surveillance. The AMPHIBIA IP66 luminaire meets these demands due to its controlled light distribution. It creates a balanced lighting environment through the use of direct/indirect light.

BIOLOGICAL LIGHT QUALITY

Data centres require 24 hour monitoring. Zumtobel's SPECTRUM light source, can support control room employees with enhanced azure-blue wavelengths that mimic daylight. A study in a Bregenz Police control room showed that light is an essential factor in influencing whether workers in control room workplaces at night can efficiently carry out their tasks, remain alert and then return to a natural circadian rhythm.

Thanks to a wide selection of light distribution options, the TECTON product family has the right lighting solution for rooms and rack layouts: Shelf Beam luminaires prioritise vertical lighting (image on the left), Wide Beam luminaires (image on the right) focus on uniformity.

| 0 | 22 | 52 | 94 | 151 | 202 | 344 | 500 lx |

5-year guarantee
With the G5 safety luminaires, the Zumtobel 5 years
guarantee now also includes the batteries, showing the
superior quality and longevity of our components.
For systems, the guarantee has been extended to 5 years,
in combination with a maintenance contract.

Extensively certified
Luminaires must be extensively tested and certified.
In many countries, specific certificates are required.
Zumtobel is one of the few providers who, thanks to its
extensive certifications, can also offer standard-compliant
emergency lighting for data centres with locations
in various countries.

GUIDANCE IN AN EMERGENCY: REDUCING FEARS

Zumtobel is not only a provider of general lighting, but also one of the largest emergency lighting manufacturers in Europe. We offer a comprehensive range of products that includes safety luminaires, escape-sign luminaires and emergency lighting systems. Lighting technology is our core competency. We develop technical lenses to achieve a variety of light distribution options for emergency lighting.

SAFETY LUMINAIRES

Safety luminaires guide and support people in the event of power failure. A comprehensive range of specialist optics allows the emergency lighting design to be tailored to suit the exact building requirements. The light is guided precisely, e.g. in stairwells or in long corridors, where vulnerable junctions are given special consideration. RESCLITE PRO uses asymmetric lens technology to highlight safety-critical objects vertically, e.g. fire extinguishers and first aid stations. In the anti-panic variant, rooms are uniformly illuminated.

Product recommendation
RESCLITE Pro safety luminaires

resclitewebapp.zumtobel.com

ESCAPE-SIGN LUMINAIRES

A versatile portfolio of escape-sign luminaires shows the way to the emergency exit in the appropriate luminance and sign size. Compliance requirements, environmental conditions and installation options, define the type of the escape-sign luminaire due to its flexible mounting options and innovative ERI spot (escape route illumination). PURESIGN is recommended for data centres. Additionally integrated rotatable LED spotlights meet the luminaire's requirements for both signage and lighting in a dual function.

Product recommendation
PURESIGN escape-sign luminaire

signwebapp.zumtobel.com

EMERGENCY ESCAPE LIGHTING SYSTEMS

The critical element of safety lighting are the batteries. We recommend distributed battery systems (EBOX), which supports maintenance and monitoring of the system. Removing the battery technology from areas of higher ambient temperatures reduces total cost of ownership.

Product recommendation
emCON/LITECOM controller for systems with self-contained batteries;
nBox, eBox and ONLITE central CPS for centrally supplied systems

TECTON / TECTON IP
Powerful, flexible and quick-to-install continuous-row lighting system. Also available with higher ingress protection ratings of IP64/54. Suitable for areas with water-based fire suppression systems.
zumtobel.com/tecton

CRAFT II
Robust powerhouse for customised hall lighting
zumtobel.com/craft2

LITECOM
Future-proof system and sensors specially developed for industrial use
zumtobel.com/litecom

Sensors
Presence, daylight, motion and multi sensors, with TECTON adapters if required
zumtobel.com/litecom

SOLUTIONS FOR THE ENTIRE BUILDING

DATA HALLS

IT personnel must be able to easily make out data displays and labels on the front of the racks.

Product recommendation
TECTON continuous-row lighting system, CRAFT II high-bay luminaire

CONTROL ROOMS

In control rooms, the focus is on avoiding direct glare and glare by reflection on the monitors. Especially in workplaces with low levels of daylight, light supports human circadian rhythms and ensures alertness and concentration at the right times.

Product recommendation
LIGHT FIELDS III workplace luminaire, MELLOW LIGHT with daylight-like light characteristics, CLEAN II Industry cleanroom luminaire

RESCLITE PRO safety luminaires
Escape route, anti-panic and spotlight lenses for walls and ceilings, even in rooms with very high ceilings *zumtobel.com/resclite*

PURESIGN escape-sign luminaires
Escape-sign luminaires with ISO 7010 pictograms for industrial use and supply systems *zumtobel.com/puresign*

Both escape-sign luminaires and safety luminaires are available with TECTON adapters.

eBox emergency escape lighting system
Central emergency power supply system with maximum flexibility *zumtobel.com/ebox*

GENERAL AREAS

From the reception and circulation areas to meeting rooms and office spaces, light plays an essential role in increasing safety, supporting work processes and improving room quality.

Product recommendation
PANOS downlight series, MIREL evolution louvre luminaire, ONDARIA round luminaire

PLANT ROOMS

Plant rooms, e.g. including the computer room air conditioning (CRAC) or uninterrupted power supply (UPS), face particular challenges from environmental conditions. Luminaries with a higher degree of protection are required to prevent the ingress of particles, moisture and damage.

Product recommendation
AMPHIBIA moisture-proof luminaire, TUBILUX tubular luminaire

OUTDOOR LIGHTING

Outdoor lighting increases safety and security on footpaths, parking zones and access roads.

Product recommendation
Thorn's Thor street and bollard luminaires, Thorn Urba street, bollard, parking and path luminaires, Thorn Plurio parking and path luminaires, Thorn Piazza LED wall luminaires

SERVICES FOR DATA CENTRES

Zumtobel works in partnership with end users and their design teams to create sustainable lighting concepts. Supporting users through the entire life cycle of its lighting solutions: From the commissioning of luminaries, lighting management systems, maintenance and digital services.
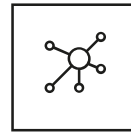
COMMISSIONING

Our highly trained technicians and professional company infrastructure guarantee smooth and punctual commissioning. With our commissioning service for lighting and controls, we ensure that your lighting system will meet the required specification and the demands of your build programme.

MAINTENANCE

Our maintenance service for lighting systems ensures that the lighting in your building can be operated efficiently. Building owners or operators are legally obliged to periodically ensure the complete functionality of the emergency lighting infrastructure. We help you maintain your emergency lighting system and document the result. A project specific Zumtobel SLA (service level agreement) gives you peace of mind.

DIGITAL SERVICES

A modern LED lighting infrastructure can function as the part of a connected, intelligent building automation and control system. Lighting infrastructure can be enhanced with intelligent sensors and other IoT elements, for the seamless monitoring of the environmental conditions. Remotely monitoring the energy performance and health of the lighting system provides insights into your system processes and lighting infrastructure. Further optimisation can be achieved through the analysis of the collected data and exported into dashboards.

THE LIGHT

Lighting and
emergency systems
+
Controls
and sensors
+
Technical and
financial
services
+
Digital
services
=
Integrated
lighting
solutions

zumtobel.com/contact