
ZUMTOBEL
LIGHT
FOR
EDUCATION
FROM INFLEXIBLE LEARNING ENVIRONMENTS TO EDUCATIONAL ARCHITECTURE
AS AN ADAPTABLE ORGANISM OF THE FUTURE

CONTENTS

CREATING LIGHT CREATES CONCENTRATION

The enjoyment of learning, concentration, inspiration and creativity – light shapes and energises learning environments. We show you how a balanced combination of daylight and artificial light supports a variety of teaching methods – from focused individual work to interactive group work.

"The decisions we make today will shape our future."

INNOVATIVE LIGHT FOR NEW PEDAGOGICAL CONCEPTS

Transformation of the educational landscape requires not only new pedagogical concepts, but also a redesign of physical spaces too. A holistic approach takes into account the importance of space and light, to better meet the requirements of teachers and students alike. Great architecture makes a significant contribution to health and well-being as a basis for concentration and successful learning. Light creates places of strength and favourite spaces for stimulating learning experiences.

WORKING TOGETHER IN A STIMULATING ATMOSPHERE

From closed, inflexible classrooms to open spaces and from "everyone for themselves" to learning together: modern educational architecture supports teamwork skills through collaborative learning, for example in so-called marketplaces, on seating steps or in reading galleries. Several classrooms are grouped around open-plan learning areas, while uniform illumination of the zones encourages people to gather and interact.

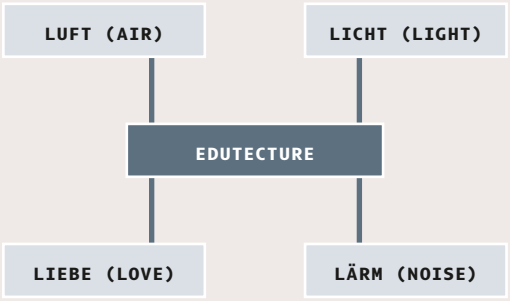
LEARNING WITH ALL THE SENSES

Research findings on multisensory reinforcement show that learning processes are more effective when supported by multiple sensory impressions. Even in optimal visual conditions supported by artificial light and daylight, disruptive acoustic influences can still have a counterproductive effect. Acoustic luminaires offer high-quality sound absorption for efficient communication and focused learning.

CREATING SPACES FOR WELL-BEING

tunableWhite creates the ideal conditions for a positive learning environment focused on health and well-being. Variable light colours and intensities enable the lighting to adapt to the different learning environments. tunableWhite combines with daylight to support the circadian rhythms of students and teachers, helping to increase well-being, improve sleep quality and enhance cognitive performance during waking phases.

In her trend report, the German architect and trend consultant Oona Horx-Strathern describes how the four “Ls” in the field of edutecture can improve the ability to learn. Using the correct lighting, including acoustic luminaires and smart lighting controls, makes a significant contribution to designing architecture for successful learning.



FLEXIBLE ROOM LAYOUT FLEXIBLE LIGHT

Dynamic educational establishments require flexible room layouts that can only be fully utilised with the help of variable lighting and are also fit for the future. The right lighting scene supports a variety of learning methods, from focused individual work to group interactions. Lighting controls are not just for new buildings: thanks to wireless lighting controls, renovated schools can also create learning environments that support creativity and collaboration through the dynamic of light.

SUSTAINABLE EDUCATIONAL ARCHITECTURE

The EU Green Deal aims to achieve a climate-neutral Europe by 2050. It also emphasises the importance of environmental education, which can only be delivered in sustainable educational buildings. The aims of the Green Deal extend far beyond energy efficiency: environmentally friendly materials and waste avoidance also reflect the principles of the circular economy, with resources fed into a subsequent life cycle at the end of the utilisation phase. At Zumtobel, luminaire development is therefore increasingly being driven by its Circular Design Rules, which are based on the principles of the circular economy.

ENERGY SAVING THROUGH REFURBISHMENT

As a result of changes to lighting standards, the ban on light bulbs and the need for innovative pedagogical concepts, many educational establishments are being forced to undergo refurbishment. Zumtobel’s versatile luminaire portfolio offers extensive solutions to aid this transformation. The improved efficiency of LED lighting helps save a considerable amount of energy. Simple dimming / brightening and smart control options, such as presence detectors and daylight linking regulation, offer additional savings potential.

UWE Engineering Building, Bristol | GB

CREATING FAVOURITE SPACES FOR LEARNING

"Child-centred school building" makes a school establishment more than just a technical construct – children's needs, perspectives and experiences are at the heart of the design. As a "third teacher", educational architecture contributes to successful learning, with light and space playing a key role by dynamically supporting a range of requirements.

EDUTECTURE: THE CLOSE CONNECTION BETWEEN EDUCATION AND ARCHITECTURE

Trend consultant and architect Oona Horx-Strathern hints in her trend report at the obvious link between learning spaces and knowledge transfer. It is no coincidence that knowledge culture is one of the 12 megatrends, as the future of our society is heavily dependent on how we manage education. This change must be shaped not only by technology but also by architecture. The focus should be on stimulating and flexible environments in which learners' individual needs are met through the creation of favourite spaces – places that offer the perfect environment for collaboration, creativity and knowledge transfer.

LIGHT FOR SUCCESSFUL, ENJOYABLE LEARNING

In favourable lighting conditions, learners are happier to experiment, more creative and solution-oriented, and more attentive, focused and relaxed. Current research findings confirm these correlations (examples p. 70), making it even more important to incorporate lighting in the early planning phase when creating favourite spaces. To this end, Zumtobel's custom solutions are designed to support the harmonious interplay of space, people and light, using luminaires, controls and service from a single source to create innovative lighting concepts for a stimulating learning environment.


Gruppenraum

CONCENTRATED LEARNING IN FOCUS

Concentration is not an accidental by-product. It is the result of the subtle interplay of multiple factors that make it easier for learners to stay focused, with senses of sight and hearing in particular playing a key role. Lighting solutions that integrate both daylight and acoustic requirements in their concept contribute to an atmosphere that promotes concentration.

STIMULATED BY DAYLIGHT

Contemporary learning requires natural light. As the primary light source, daylight increases alertness and concentration, and supports numerous physical processes in the body. Motivation and concentration increase. It becomes easier to absorb and process information. Large windows, skylights and, above all, sufficient breaks in nature are therefore essential.

ACOUSTIC LUMINAIRES: OPTIMAL VISION AND HEARING

Luminaires that cleverly combine light and acoustic elements are problem solvers in rooms with lots of concrete, aluminium and glass. Thanks to its excellent absorption properties, additional fleece absorbs the sound. The materials used also help the space feel cosy, making acoustic luminaires the perfect solution for everywhere from libraries to classrooms in educational buildings.

"I am confident both teachers and students alike will experience the new possibilities of light variations as an enhancement of their everyday school life, which will not only result in a more interesting school day, but also reduce fatigue. Our preprogrammed variation scenarios provide the right lighting conditions for different activities."

Merete Madsen, Lighting designer for Herstedlund school
in Lighting Metropolis (online 2017)

STUDY ON DYNAMIC LIGHT AT HERSTEDLUND SCHOOL, ALBERTSLUND (DK)

The study investigated how light contributes to motivation, communication, activity levels, atmosphere, visual comfort and behaviour in the classroom.

Learning is not only about optimising **visual** perception, but also about fulfilling **emotional** needs, such as safety, security, structure, comfort, opportunities to retreat and relax, and variety in interior design, especially in the context of current pedagogical concepts. While daylight supports physical processes, especially near windows and during important breaks, artificial light enhances the indoor environments in which we spend our lives. Targeted use of light at the right time also supports our **biological** clock.

More information about the study on using lighting as a means of structuring and supporting teaching and learning activities.

SUPPORTING HEALTH AND WELL-BEING WITH TECHNOLOGY

The learning space is widely regarded as a "third teacher" and is being researched intensively by scientists in various disciplines. This requires a holistic approach to architecture. With Active Light, Zumtobel offers students and teachers alike comprehensive support: visually, emotionally and biologically.

TUNABLE WHITE

tunableWhite supplements natural daylight. By providing the right colour temperature and light intensity at the right time, it supports people's physiological functions and brain activity. Warm light in the morning and evening supports well-being and relaxation, while bluish light has a stimulating effect. This provides positive support for the circadian rhythm in interior spaces, improving concentration and performance during waking phases.

More about tunableWhite

ZUMTOBEL SPECTRUM

Inspired by nature. The Zumtobel SPECTRUM technology also facilitates optimal well-being and maximum concentration: azure wavelengths are intensified in order to mimic the spectral distribution of daylight within the wavelength range in which key receptors in the eye are more sensitive. Visual acuity is improved by reducing the pupil's size. Compared to conventional LEDs, this optimised spectral distribution has a pleasant, neutral white light colour and makes an ideal contribution to the melanopic system and therefore to physiological processes.

More about Zumtobel SPECTRUM

ONE ROOM – MANY LEARNING SCENARIOS

Learning is continuing to develop and no longer takes place exclusively in traditional face-to-face lessons focusing on the board and teacher. Instead, it involves a dynamic mix of group work, communication and relaxation phases. This variety is also reflected in the lighting and interior design. Changes to the environment have a supporting effect – and not just in terms of lighting. Traditional front-of-class teaching with a visual focus on students and projection surface/board requires different lighting conditions than communication in a group circle or a space of sanctuary on a personal seat cushion, for example.

Front-of-class teaching:
Open, uniform room character with TECTON continuous-row lighting system, integrated MIREL luminaires and wall washers on the board. Support for a stimulating, traditionally focused learning atmosphere, which exceeds all standard-related requirements of the classroom.

Communication:
Pressing a button on the control unit supports interaction or creates moments of retreat. In these learning situations, downlights or spotlights are used as a flexible option for enhancing the TECTON continuous-row lighting system in suitable positions.

TECTON: LIGHT, EMERGENCY LIGHTING AND SENSORS IN ONE STURDY TRACK

The TECTON continuous-row lighting system combines a robust, industrial look with an all-inclusive concept: the power supply, lighting controls and connection to the emergency lighting are seamlessly integrated in the trunking. The integrated luminaires offer flexible support for the learning tasks, creating separate zones and selectively accentuating furniture and objects.

FLEXIBLE LIGHTING SOLUTIONS FOR DYNAMIC LEARNING SPACES

Learning no longer happens only in a standardised classroom or auditorium, but instead takes place anywhere and at any time. Learning spaces are increasingly becoming leisure and living spaces – and even social meeting places for clubs or cultural events. Innovative educational architecture reflects new pedagogical concepts in the multifunctionality of the room as a result of participatory decision processes with the users. Dynamic lighting solutions with a balance of cosy living elements and glare-free work light integrate into these new learning environments.

LIGHT STIMULATES AND SUPPORTS

Innovative educational concepts focus on personalisation of learning spaces and times, with teachers acting as learning guides. Versatile educational and experiential spaces support creativity, autonomous learning and collaboration in heterogeneous groups. In the context of after-school care, schools become vibrant places in which identity can be developed. Light offers emotional support and stimulates these learning environments.

ENABLING COLLABORATION

New spaces for informal collaboration, such as seating areas in corridors, on steps or in lounges, promote collaboration and the exchange of ideas. Various digital devices are used in these spaces. Avoiding reflected glare and loss of contrast on the screens is a top priority. A productive and pleasant collaborative environment can be created when a sufficient amount of daylight is ensured and the artificial light exceeds the minimum required by standards. For good perceptual processes thanks to the prevention of glare, sufficient contrasts and balanced shadowing.

CREATING ATMOSPHERE

A combination of luminaires and luminaire design, lighting scenes, luminaires with acoustic elements, furnishings and materials produces a room atmosphere for focused and creative learning processes. The colour temperature can be adjusted to support different scenes as required: a reduced, warm light promotes creative development and offers sanctuary, while a cool and brighter neutral white light has a more stimulating effect and provides a backdrop for concentrated, alert collaboration. Light enables versatile room use at the touch of a button.

SUSTAINABILITY FOR SCHOOLS

Educational establishments shape the mindset and behaviour of students. They should also act as role models when it comes to sustainability and make both teachers and students aware of the pressing issues of our time. Only a sustainable environment has an authentic impact and supports the aim of the Green Deal to create a climate-neutral Europe by 2050.

EDUCATIONAL ARCHITECTURE FOR FUTURE GENERATIONS

Architecture, (lighting) technology and design retain their value best when they are timeless and durable. Sustainability also means using resources and components that have already been consumed for as long as possible. Educational buildings for future generations are buildings that have been thought through from beginning to end and remain open to new usage scenarios.

EPDS REINFORCE GREEN BUILDING CERTIFICATION

In educational buildings, Green Building certifications such as LEED, BREEAM and DGNB not only help to reduce ecological footprint but also create a healthier and more comfortable environment for students and teachers alike. For more than 10 years, Zumtobel has been authorised to provide Environmental Product Declarations (EPDs) in a separate process at short notice for building certification. An EPD discloses the environmental impact of a product throughout its entire life cycle and is therefore an important factor in achieving the coveted building label.

SUPPORTING THE CIRCULAR ECONOMY WITH THE CDRS

At Zumtobel, circular economy principles are incorporated into product design and management processes right from the start, with the Circular Design Rules (CDR) – which Zumtobel developed in close collaboration with design studio EOOS and consultancy EPEA – playing a key role. Building in line with the principles of the circular economy therefore not only reduces ecological footprint, but also offers economic and strategic advantages that boost profitability in the long term.

More about Sustainability

More about Green Building

More about Circular Economy

1 000 000 kWh

Heat consumption of a medium-sized school per year
(source: ifeu)

100 000 kWh

Power consumption of a medium-sized school per year
(source: ifeu)

45,6 billion EUR

Investment backlog for the required refurbishment of schools
(source: kfW)

17 %

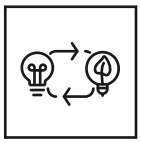
of municipalities report a serious
investment deficit for schools
(source: KfW-Kommunalpanel 2022)

47 – 66 %

Between 47% (Bavaria) and 66% (North Rhine-Westphalia) of those surveyed in Germany complain of inadequately refurbished school buildings (source: ifo Bildungsbarometer 2023)

Three levels of sustainable refurbishment

LEVEL 1: CHANGE TO LED

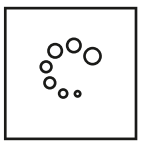


Fluorescent lamp
→ LED

approx. 70 %

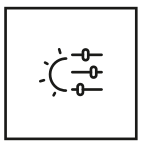
energy saving

LEVEL 2: LIGHTING MANAGEMENT



Simple dimming

Presence detection

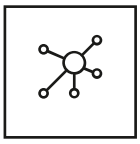


Daylight controls

approx. 10 – 20 %

additional energy saving

LEVEL 3: IOT & MONITORING



Connected trades (IOT)

Monitoring

= optimised building processes

More about Sustainable Refurbishment

REFURBISHMENT IMPROVES LIGHT QUALITY AND EFFICIENCY

For over 80 years, light in educational establishments was provided by fluorescent lamps. From 2023, the EU directive limiting hazardous materials in electrical and electronic appliances required an end to this lamp technology. Many primary and secondary schools already in need of refurbishment therefore still need to make the switch to innovative and extremely efficient LED technology, which represents a milestone not only in energy efficiency and cost reduction, but also for improved light quality and minimum maintenance requirements

SIX REASONS WHY LIGHT REFURBISHMENT IS WORTH IT

Contribution to learning processes

Light refurbishment improves room quality and increases concentration and attention among students and teachers. A reduced reddish light atmosphere promotes creativity, while bluish light components have a stimulating effect.

Health and well-being

Newly integrated lighting concepts with controls have a stimulating and calming effect. Artificial light complements with daylight to help stabilise the body's internal clock and counteract fatigue while learning. Light influences mood and well-being.

Optimisation of learning spaces through lighting management

Through the integration of lighting management after a refurbishment, different light scenes enhance the dynamic of the room at the touch of a button or at different times, for an even more versatile learning environment.

Sustainability and funding programmes

The majority of CO_2 emissions from lighting are produced during the operating phase. New sustainability laws and funding for refurbishments are important drivers of the modernisation of lighting. Refurbishment not only reduces the educational establishment's ecological footprint, but also creates a pleasant learning environment that promotes the well-being of the people in the building.

Energy efficiency

Lighting refurbishment enables significant energy savings to be made. New, energy-efficient LED lighting systems reduce power consumption and climate-damaging emissions.

Short amortisation periods

Investment in new lighting reduces energy costs and minimises maintenance costs, resulting in short amortisation periods.

Resource-saving refurbishment

Zumtobel not only considers the availability of spare parts, but also the options for converting luminaires with upgrade functions to improve comfort and energy efficiency and ensure the longest possible service life. Refurbishment kits for luminaires offer custom solutions for refurbishment projects.

	9 louvre luminaires FED2 2/54 W Fluorescent lamps	**9 refurbishment kits LED without controls**	**9 refurbishment kits LED with controls**
Energy requirements [kWh/year]	1925	529	169
LENI [kWh/(m² year)] Energy efficiency lighting according to standard use as per DIN EN 15193-1	27.5	7.56	2.41
Costs [EUR/year]	577.40	158.72	50.57
Electricity price: EUR 0.3/kWh	772	212	67.6
Savings through refurbishment kits		**73 % without lighting controls**	**91 % with lighting controls**

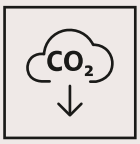
SEVEN ADVANTAGES OF REFURBISHMENT KITS

Energy savings and reduced emissions during operation

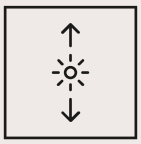
Lower investment costs for refurbishment kits compared to complete replacement

Reduced operating costs (maintenance, energy)

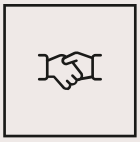
Improved light quality



Conserves resources by retaining the luminaire components



Complete renovation of the ceilings / walls is avoided with refurbishment kits



Zumtobel guarantee and CE mark for conversion kits

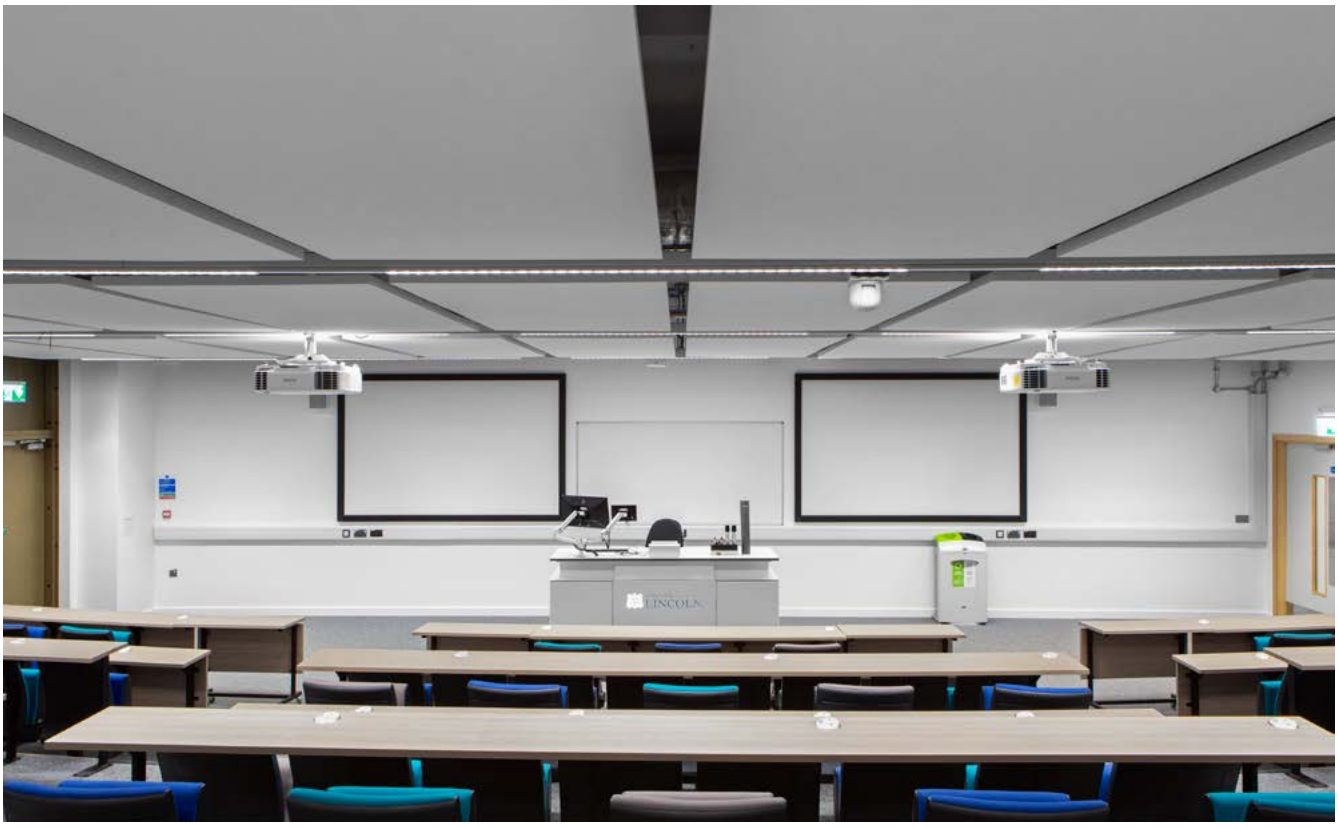
SUCCESSFUL REFURBISHMENT THANKS TO REFURBISHMENT KITS AND MODULAR PRODUCT DESIGN

Completely replacing the luminaires is not always the first choice for ecological and economic reasons. Zumtobel supports careful refurbishment by retaining the luminaire components in the building using refurbishment kits, which are available as special or standard solutions, for SLOTLIGHT, MIREL, PANOS and ONDARIA, for example.

The TECTON continuous-row lighting system was developed over 20 years ago with flexibility and long-term, modular use in mind. It enables tool-free conversion of fluorescent lamps to various LED solutions in order to meet the changing requirements for rooms and workplaces. Safety luminaires, control components and sensors can be easily integrated.

More about Refurbishment kits

More about Refurbishment



Lincoln Medical Sciences Building, University of Lincoln | GB

Service process – Zumtobel's refurbishment expertise

1. Analysis of the current situation
What requirements have changed since the new installation? Can the values required by the EN 12464 standard still be complied with? What condition is the system in?

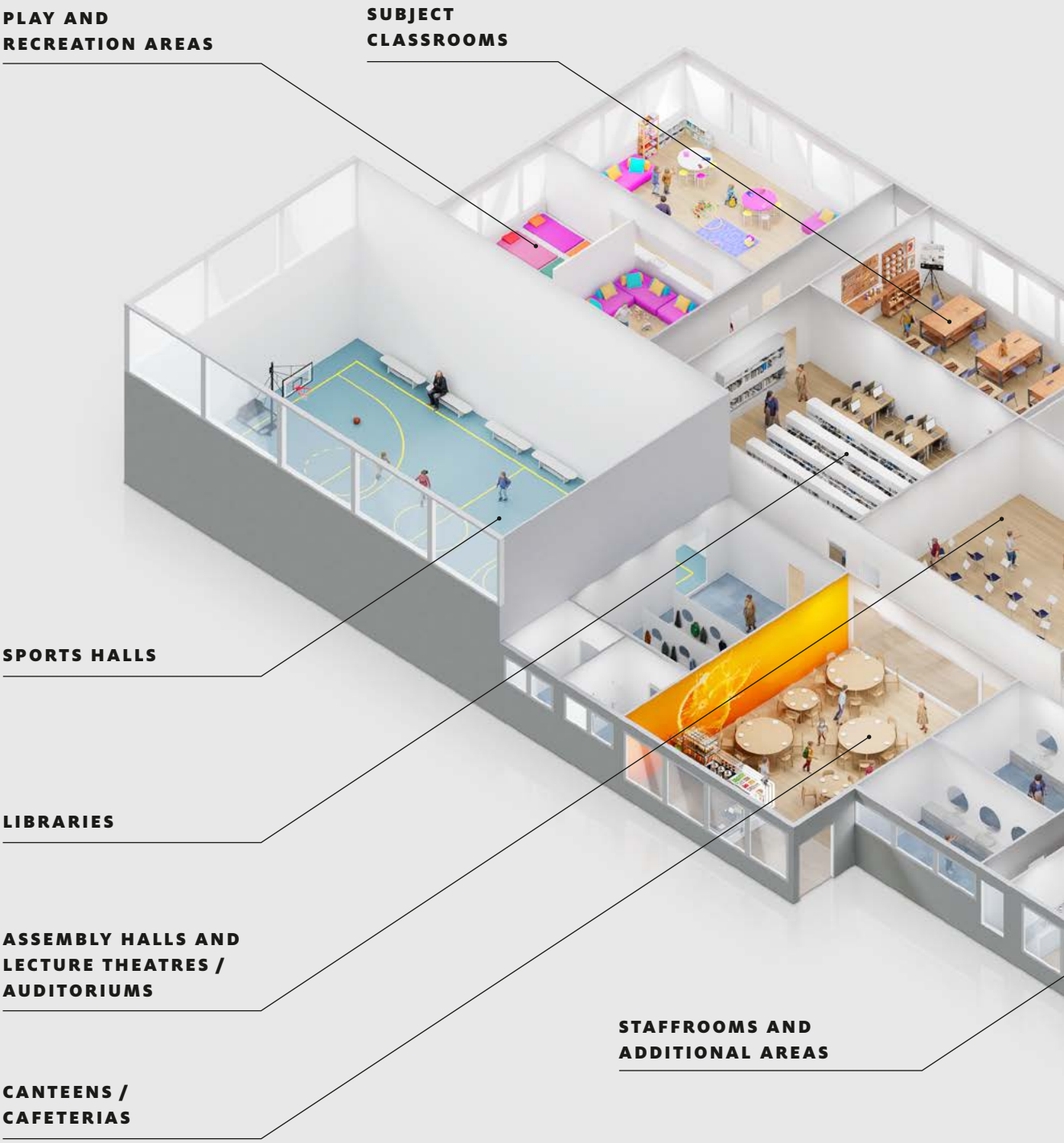
2. Complete replacement or conversion kits
Does a conversion kit make economic and design sense or would complete replacement be a better refurbishment strategy?

3. Special requirements
Which zones have special or historical new requirements in terms of maintenance, a high degree of protection (e.g. dust formation), colour rendering, ball- or vandal-proofing?

4. Sensors and controls
Can lighting controls with cable be integrated or should a wireless radio solution be used? What kind of sensors, operating concept and light scenes will be required to meet the intended usage goals?

5. Emergency lighting
How can the emergency lighting be adapted to ensure it complies with the latest standards and integrated into new lighting controls if necessary?

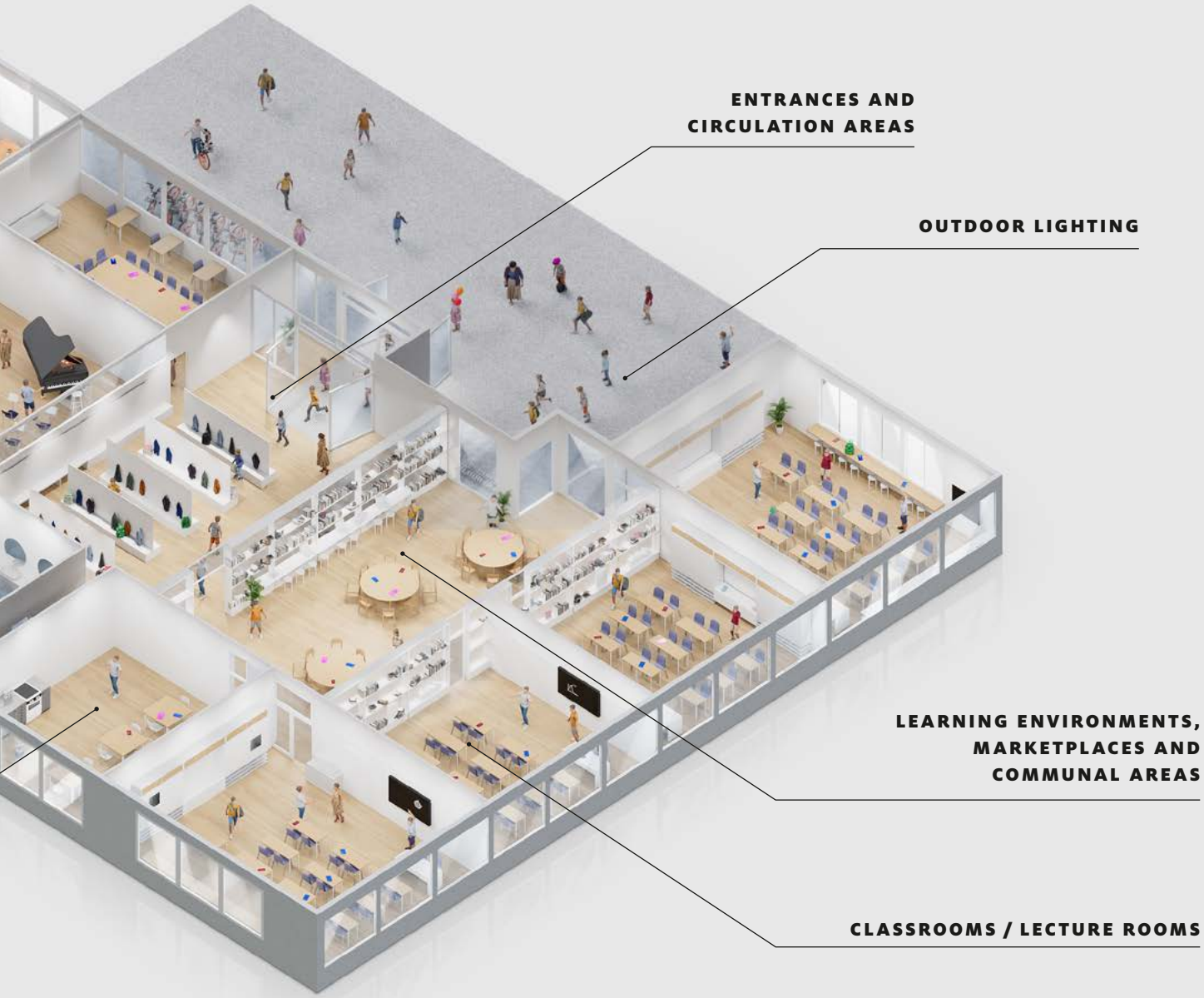
6. Quality inspection and acceptance
Does the refurbished system comply with the latest standards and meet user expectations? Are the light scenes and sensors set as required?



LUMINAIRES, CONTROLS AND SERVICE FROM A SINGLE SOURCE

Sustainable and future-proof lighting concepts for educational establishments need to be extremely well thought-out and flexible – and take into account new learning concepts and room uses. Whether in the classroom or in the library, outdoor or indoor favourite spaces, sports halls or lecture theatres, usage situations for light in educational establishments are as varied as Zumtobel's lighting solutions, which use lighting controls to offer dynamic support for the wide-ranging requirements. Zumtobel offers custom solutions for the most stringent requirements in terms of installation, lighting technology, control and design. The goal is to support students not only visually, but also emotionally and biologically. Through building identity in a healthy and supportive space, they should be enabled to perform at their best.

FULL SERVICE SUPPLIER FOR EDUCATIONAL ESTABLISHMENTS



Lighting and emergency systems + Controls and sensors + Light as a Service + Digital Services = Integrated lighting solutions


MUT

ENTRANCES AND CIRCULATION AREAS

A friendly welcome and guidance

The main requirements for light in a reception area to ensure high levels of comfort and safety include providing employees and visitors to the school with a friendly welcome and helping them quickly find their way around the building by supporting the adjustment between the outside and inside lighting conditions. The neighbouring circulation areas, which are frequently also used as extra learning spaces, also place further demands on the light in addition to its guiding function: good contrasts, prevention of glare on digital devices and balanced shadowing for easy facial recognition.

PANOS

LANOS

SLOTLIGHT infinity II

VIVO II

PERLUCE

MIREL evolution

CREATING GENTLE TRANSITIONS

Daylight linking controls with a well-thought-out selection of luminaires compensate for significant differences in luminance, depending on the weather or time of day or year. This improves perception and orientation when transitioning between outdoor and indoor areas. A mix of surface and directional light sources enhance the room and define distinctive zones.

GUIDING SAFELY

A combination of light lines and downlights is the first choice for circulation areas as this provides structure and orientation. However, in many educational buildings, corridors and staircases are also used as informal and formal learning spaces. The work tools and perceptual processes used here require light conditions similar to those in the authorised learning spaces, with good contrasts, shadowing and glare prevention, especially for the screens of digital devices.

CLASSROOMS/ LECTURE ROOMS

Education lights you up

Well-being, concentration and attention are closely connected to successful learning. Light and the space have a regulating effect. As places in which strength and identity can be cultivated, classrooms require different light scenes for different purposes, from front-of-class teaching and focused individual work to a cosy atmosphere for discussions and group work. Adapting the light in this way creates optimal perceptual conditions even when the gaze changes frequently.

ECOOS II

LIGHT FIELDS III

MIREL evolution

PERLUCE

TECTON MIREL

SLOTLIGHT infinity II

CLARIS evolution

LANOS

PERCEPTION AND SPATIAL EXPERIENCE

The lighting must create good contrasts for changing media use, prevent glare and provide sufficient shadowing to support facial perception and access to the spatial environment. Balanced distribution of luminance prevents the visual system becoming fatigued and can be complemented by directional light sources, which create accents and structure the space. Variety is also a priority when it comes to light. Light scenes help easily adapt the atmosphere to the learning requirements and needs of teachers and students at the touch of a button.

DAYLIGHT FOR HEALTH AND SUSTAINABILITY

Daylight is a stimulating and stabilising factor for the body's internal clock – during breaks or at windows. Lighting controls with tunableWhite and the matching luminaires support this natural interaction. Lighting management with daylight and blind controls prevent glare from direct sunlight and heat build-up. Sophisticated lighting design creates a classroom that balances comfort, energy efficiency and engagement.

LEARNING ENVIRONMENTS, MARKET-PLACES AND COMMUNAL AREAS

From a place of learning to a place of well-being

Learning environments create flexible and versatile zones that act as meeting places for communication with a marketplace in the centre. These rooms reflect modern, cross-classroom teaching methods with a focus on social connection, identity and learning in teams. The focus is also on communication and project work. A good lighting concept uses the influence of daylight and optimises the use of artificial light using smart controls. Luminaires with acoustic elements also help create a feel-good environment.

LANOS

ONDARIA II

SLOTLIGHT infinity II

SLOTLIGHT round

PERLUCE

TECTON MIREL

VIVO II

VIVO II pendant
with decorative shade

DESIGN WITH DAYLIGHT AND ARTIFICIAL LIGHT

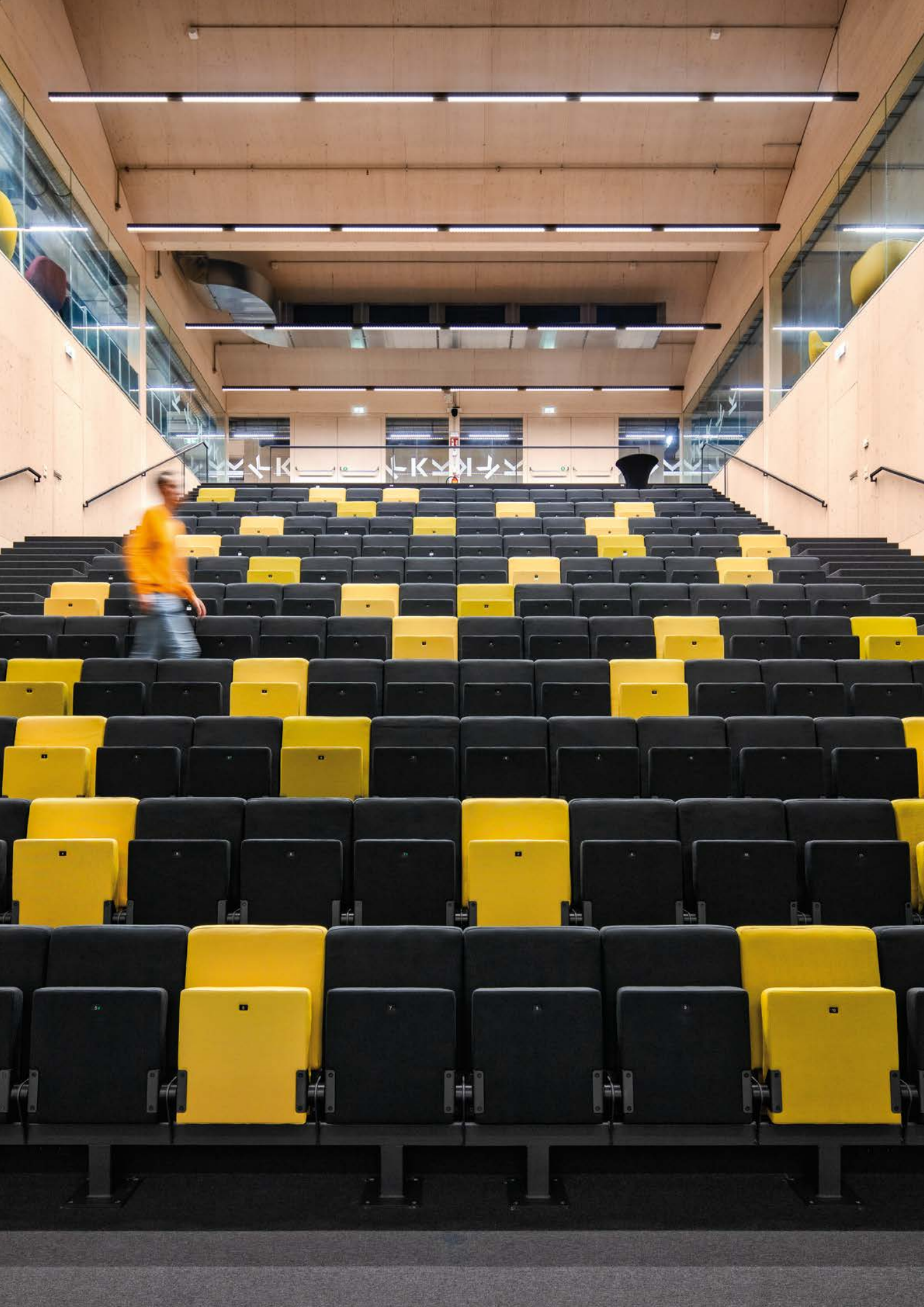
In schools, breaks with high levels of exposure to daylight in particular make a positive contribution to physiological processes. As meeting points and central places of communication, marketplaces feature generous daylight openings. Blind control systems reduce the heat and glare from direct sunlight. Technologies such as tunableWhite create dynamics by adjusting light intensity and colour as required, allowing the room to be presented differently to ensure the best light for focused learning or creative group activities.

COSY AND SUSTAINABLE

Learning environments with marketplaces are characterised by decorative elements and create places of identification with a cosy ambience. Decorative luminaires with a selective interplay of light and shadow define the central point for social interaction – just like the fireplaces of the past. This deliberately designed layout contrasts with monotonous uniformity and promotes a productive learning environment through creativity – offering energy-efficient operation..

SEEING AND HEARING IN HARMONY

In increasingly open-plan learning spaces, acoustics play a decisive role alongside light. Acoustic luminaires combine lighting with sound-absorbing properties, creating an environment in which visual learning and clear communication find the perfect balance.



ASSEMBLY HALLS AND LECTURE THEATRES/AUDITORIUMS

Supporting multifunctional use

Light in lecture theatres is as varied as the use of space, with high seating capacities in an often rigid and visually focused arrangement: from bright to dimmed, from bluish stimulating to reddish calming light and a celebratory atmosphere. The multimedia equipment and the focus on the teacher or presenter require a well-coordinated lighting concept at the front of the hall – for good contrasts in media use and perfect facial perception of the speaker, who demands the full attention of the audience.

LIGHT FIELDS III	 SLOTLIGHT infinity II	 ECOOS II	 CLARIS evolution
 PANOS DOWNLIGHTS	 LINCOR	ONDARIA II	 MIREL evolution

EVENT-STYLE LEARNING

A well-coordinated composition of luminaires for functional, uniform surface lighting through to atmospheric, spotlight accent lighting supports a wide range of room uses. At the touch of a button, the hall becomes a stage for a concert in the evening and a traditional, functional learning space for large groups in the morning. With the right operating concepts, the lighting controls offer convenient interfaces between people and light in the room.

CREATING FOCUS

To captivate large groups in a lecture theatre, the people on stage are the centre of attention. Poor facial perception has a tiring effect. Light should fall on the face from the front. The entire radius of action in the presentation area therefore requires a great deal of attention when it comes to the lighting design. Balanced shadowing and semi-cylindrical illuminances create friendly and three-dimensional facial perception.

CREATE ATMOSPHERE WITH TUNABLEWHITE

Want a cosy, subtle and warm white atmosphere for the piano concert? Need to energise tired learners in the afternoon with a bright, daylight-white atmosphere? tunableWhite technology offers multiple options for changing the lighting at the simple push of a button. Dynamically programmed lighting scenes counteract monotony, especially when there is a lack of natural daylight.


MACH VS-1
Only safety footwear past this point

SUBJECT CLASSROOMS

Specific requirements for holistic learning

The requirements for lighting in subject classrooms range from controlling dust deposits in the workroom to flexible room use in the music room and maximum colour rendering in the art room. The technical equipment in these rooms is geared towards the goal of holistic learning. For this reason, lighting in dedicated subject classrooms must not only fulfil basic functional requirements, but above all support practical experience and enable sensory experience and creativity.

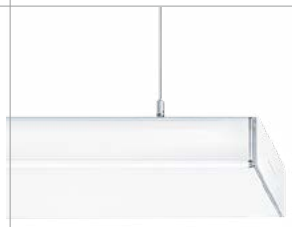
PERLUCE IP54

TECTON MPO IP 54

CLEAN II industry

SLOTLIGHT IP54

MIREL evolution



ECOOS II

PANOS

ONDARIA II

TECHNOLOGY AND COMPUTER SCIENCE

Protection ratings of at least IP54 are required to ensure a long service life for luminaires in workrooms. These provide effective protection against dust and moisture. In environments with particularly challenging conditions, the use of even more robust luminaires with additional protection against mechanical impacts is recommended. Computer rooms place strict visual demands on lighting, such as avoiding psychological glare or reflected glare on screens.

ART AND CULTURE

In the art room, lighting requirements are determined by the need for the precise visual assessment of colour and detailed works of art. To meet these requirements, high illuminance levels in the 750 to 1000 lux range and excellent colour rendering (CRI > 90) are needed. The music room is characterised by the flexible use of the space, including by choirs, orchestras and theatre groups. Different luminaires and lighting controls can be used to create the right atmosphere for enjoyable cultural events.

NATURAL SCIENCES

Chemistry, physics, biology – experimentation is the focus of these subject classrooms. High illuminance levels, balanced shadowing, excellent colour rendering and the avoidance of reflected glare are essential for the perfect perception of the material or chemical reactions.

LIBRARIES

Balance of spatial experience and perception

An inviting atmosphere, focused learning or joint study sessions – libraries are rooms with a variety of uses. The success of the available products and services as well as the frequency of visits depend on the room's attractiveness. A balance of spatial staging and individualised support for visual tasks is required.

TECTON MIREL

CLARIS evolution

ECOOS II

LANOS

ONDARIA II

PANOS INFINITY

SUPERSYSTEM integral – linear

SUPERSYSTEM integral – accent lighting (spotlight)

BOOKS IN FOCUS

Despite digitalisation, many tasks in libraries still involve the classic book in paper form. Homogeneous illumination of the shelves with the required vertical illuminance of 200 lux facilitates quick visual orientation when selecting literature. Uniform horizontal illuminance levels of 500 lux, with no glare, create perfect contrasts for reading anywhere in the room.

CREATING PLACES OF SANCTUARY

Not only a standardised lighting solution for perceptual processes, but also the emotional spatial support for rest, regeneration, sanctuary and concentration is crucial for the right light in the library. Directional light sources and the use of cosier warm white light enhance this atmosphere.

PLAY AND RECREATION AREAS

Sensory play zones in and around the building

The design of recreational and play areas in all-day care facilities, preschools and nurseries has a lasting impact on social, cognitive and motor skills. The zone-dependent adjustment of light levels and colour temperatures creates a dynamic space that supports a variety of sensory play and learning experiences. Creating safety with the right light is a fundamental requirement – both outdoors and indoors.

SAFETY FROM MORNING TO NIGHT

Playing and learning while utilising daylight indoors and with perfectly designed outdoor areas is ideal from a health perspective. Artificial light is used at night. Schools are central cultural and social meeting places, even in the evening. Well-designed lighting counters the primal fears and insecurities of darkness. Vandal-proof and ball-proof luminaires offer additional protection for sports and games and reduce maintenance costs.

FAVOURITE SPACES FOR LITTLE EXPLORERS

Play zones offer variety through light zoning and dynamics. The glare-free, uniform and functional general lighting is accentuated by directional light sources that emphasise objects and areas. The visual tasks involved in playing in flexible room structures are supported by suitable furniture and room zoning, combined with appropriate colour rendering and balanced shadowing. Light creates places of diversity and identification with a feeling of home – play areas that stimulate children's spirit of discovery.

CANTEENS/CAFETERIAS

From culinary to social enjoyment

Canteens are more than just functional places in which to satisfy hunger. The design approach takes into account the need for friendly interactions, relaxation and communication. The canteen is a hub for communication. The focus is therefore on supporting informal interactions between pupils, students and teachers. An important argument for perfectly coordinated intensity, light colour and colour rendering in relation to the food: because as we all know, the eye eats as well.

LANOS

SLOTLIGHT round

ONDARIA II

PANOS infinity

SLOTLIGHT infinity slim

VIVO II

VIVO II pendant luminaire

PANOS DOWNLIGHTS

MULTIFUNCTIONAL THANKS TO LIGHTING MANAGEMENT

Canteens offer space for large groups and are therefore multifunctional in use. The lighting controls, adapted to the time of day and activities, enable dynamic room design. The luminaires' composition of flat and accentuating components encourages relaxed breaks in chill-out zones or lively social interactions. Indirect light distribution and daylight have a stimulating effect on tired learners and teachers.

POSITIVE ATMOSPHERE FOR DINING AND COMMUNICATING

Zoning creates privacy and security. Individual tables become private meeting points thanks to the luminaire design, for example in the form of pendant luminaires or through accentuation with flexible directional light sources. People fade into the background, yet perfect facial perception is essential for pleasant communication, which is achieved through balanced direct and indirect light distribution. The perception of the freshness and quality of the food is enhanced by high colour rendering.

SPORTS HALLS

Use by schools and clubs

Sports halls serve not only as venues for school sports but are also a central meeting point for the community. Their flexible use ranges from recreational sports to multi-purpose events such as regional festivals or concerts. They also fulfil the functions of an assembly hall or a large meeting room. The light must adapt to these uses in a variety of ways.

CRAFT II

SLOTLIGHT infinity II

BALL-PROOF AND MULTIFUNCTIONAL

Depending on the type of sport and use, the sports hall is one of the most versatile rooms, with completely different lighting requirements. Excellent light quality is achieved through uniform illuminances, avoidance of glare and good colour rendering. Planning of the system is based on the utilisation, which defines the strictest requirements for the light. Ball-proof luminaires are a fundamental safety aspect

ENERGY-EFFICIENT HALL OPERATION WITH LIGHT AS A SERVICE (LAAS)

Lighting controls for adapting to different uses offer not only convenience but also sustainable operation of the sports hall. The use of energy-efficient LED luminaires also helps to reduce energy and maintenance costs as well as the environmental impact. “Light as a Service” goes one step further by enabling municipalities to benefit from the advantages of state-of-the-art lighting technology without having to make any investment.

More about office lighting

STAFFROOMS AND ADDITIONAL AREAS

Great lighting even behind the scenes of learning zones

Even behind the scenes there should be no break in the prevailing room and light atmosphere of an educational building. Excellent lighting quality is therefore required throughout. And last but not least: aesthetically designed spaces encourage a culture of mindfulness and thus prevent vandalism – a common problem in additional areas. Zumtobel's extensive portfolio offers lighting solutions for the entire school building, all from a single source. With a wide range of office lighting products, Zumtobel is also the first port of call for the staffroom or secretary's office.

PANOS infinity

SLOTLIGHT infinity II

ONDARIA II

PERLUCE

TECTON basic

ARTELEA

SECRETARY'S OFFICE AND STAFFROOM

In traditional office environments, ergonomic lighting requirements must be met, such as avoiding glare and uniformity as well as a balanced luminance distribution in the room. In the staffroom, areas of sanctuary with a reduced, warm white lighting atmosphere exist alongside communication-promoting, stimulating and open-plan zones. Daylight and supplementary dynamic artificial light have a stabilising effect on employees' internal body clocks and well-being.

STORAGE ROOM AND TECHNICAL AREAS

From printer cartridges to extra chairs: light in storage areas is primarily intended to ensure safety. Uniform shelf lighting supports fast, visual orientation at any storage location, while continuous and well-thought-out room illumination ensures dark corners and glare are avoided. Similar requirements apply to printing and technical rooms. Presence detectors avoid unnecessary power consumption for lighting in these sporadically used areas.

CLOAKROOM, WASHROOMS AND CHANGING AREAS

Luminaires in sanitary facilities must be designed in such a way that they are resistant to the effects of moisture thanks to a higher degree of protection and flat surfaces, while also being easier to clean. Natural, shadow-free facial perception in the mirror is essential to promoting a positive self-image. This can be achieved with a high colour rendering index (CRI) and the integration of wall luminaires to the left and right of the mirror.

OUTDOOR LIGHTING

Safe meeting place in a residential area

Aesthetically designed façade and ambient lighting provides orientation and conveys a sense of security by countering the primal fear of darkness. This creates an inviting and conducive atmosphere to enable the use of schools outside school hours. In addition to safety and well-being, the design of outdoor lighting makes a significant contribution to creating a communal place with which communities and associations can identify and enjoy using.

SAFE MEETING PLACE IN THE EVENING

Footpaths and access roads are equipped with suitable light for the dark morning and evening hours. This is supported by accent lighting that emphasises intersections, special features of the building architecture, façade details, plants and seating areas. Cleverly designed lighting around school buildings counteracts unwanted presence, vandalism and potential criminal behaviour

FULL-SERVICE SUPPLIER WITH AFFILIATE BRAND THORN

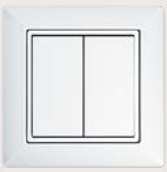
The functional quality features of successful outdoor lighting result from an appropriate and uniform illuminance, which guarantees the perception of safety in the educational building's immediate surroundings, while at the same time avoiding glare and light pollution. As a single-source supplier, we draw on the lighting expertise of Thorn Lighting, our affiliate brand in the Zumtobel Group.

	CIRCLE KIT	CIRCLE KIT tune	DIMLITE	DIMLITE pro	LITECOM	basicDIM Wireless
Dimming/brightening and grouping	● (2)*	●	● (4)*	● (16)*	●	●
Presence control			●	●	●	●
Daylight linking regulation			●	●	●	●
tunableWhite		●		●	●	●
Circadian rhythm					●	●
Automation					●	●
Venetian blind control					●	
Building monitoring					●	
Energy monitoring					● lightingGO	● to a limited extent

* maximum number of groups

CIRCLE KIT (TUNE)

An intelligent and compact control package that enables the smart management of multiple luminaires and displays predefined lighting scenes at the touch of a button. CIRCLE Kit meets the requirements of a modern office environment: the individual light settings support employees emotionally and promote well-being in the room. CIRCLE Kit (tune) is the perfect room control system with wall switches for classrooms, lecture theatres and dynamic learning spaces.



DIMLITE

From dimming/brightening and switching lights on/off centrally to creating a specific lighting scene, DIMLITE is the perfect introduction to the world of smart lighting management, with a basis module and a variety of connection options for control points, PIR or light sensors. And thanks to the dedicated DIMLITE app, electricians and electrical consultants can easily create wiring diagrams with the desired functions and products.

DIMLITE PRO

Small but perfectly formed: DIMLITE pro enables the lighting controls in traditional workplaces to be planned and commissioned on a graphic interface. It takes just a few clicks to create a powerful system from individually assembled components. Sensors, conventional switches and remote controls make DIMLITE pro simple and smart to operate. DIMLITE pro is also the perfect control system for reducing energy costs and CO_2 emissions and improving lighting comfort.

LIGHTING MANAGEMENT

Smart lighting controls for efficiency, comfort and safety

Use less energy, reduce CO_2 emissions, cut costs and meet sustainability requirements: the successful operation of an educational building requires smart building infrastructure, not only to ensure safety and efficiency, but above all to increase comfort.

THE RIGHT LIGHTING SCENE FOR EVERY REQUIREMENT

Dimmed, warm, communicative – lighting can act like a fireplace around which employees gather for creative brainstorming session, or it can be stimulating with bright room boundaries, for social interaction in open-plan zones. Cylindrical illuminance that is perfectly adapted to the space makes it easier to recognise faces during video conferences. A variety of lighting scenes with an extensive range of smart control options for a variety of work uses.

LIGHTING CONTROLS: FROM THE INDIVIDUAL ROOM TO THE ENTIRE BUILDING

Always the right solution for adjusting light: LITECOM is suitable for central lighting controls in the whole building with presence and daylight sensors, emergency lighting integration or integration in the building management system via BACnet. CIRCLE Kit (tune) can be used for room control via wall switches in the canteen, in communal areas, auditoriums or classrooms. DIMLITE pro is suitable for presence and daylight linking in the traditional workplace. basicDIM Wireless is a renovation solution for upgrading switchable old installations. The wireless room solution can be integrated via a DALI gateway in LITECOM.

LITECOM & LITECOM INFINITY

LITECOM is a central lighting controls system for the whole building with presence and daylight sensors, emergency lighting integration or integration in the building management system via BACnet: clear and self-explanatory, for convenient commissioning, intuitive everyday use, simple installation and tailor-made expansion, division or redesign options. Additional functions can be adapted at any time with the help of user-friendly apps.

BASICDIM WIRELESS

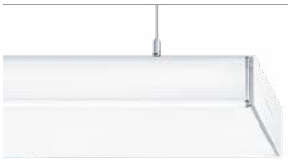
Wireless, slimline, easy to install: basicDIM Wireless is a perfect lighting control system for individual rooms but can also be used throughout the building. Thanks to wireless remote control, basicDIM Wireless is extremely quick and easy to commission and is a problem solver in renovation projects without DALI wiring – for smart lighting control via app, wireless wall switch or sensor. The wireless room solution can be integrated via a bDW DALI gateway in LITECOM.

EMERGENCY LIGHTING

Integrating emergency lighting, maintaining an overview of emergencies
Emergency lighting is a lifesaver because it prevents panic and accidents in the event of a power failure by providing clear orientation and adequate perception processes. In buildings with large gatherings of people, such as educational establishments, it is an essential safety factor and not just a matter of fulfilling legal requirements. In an emergency, the battery supply of the reliable and well-maintained emergency lighting system marks the safest escape route and facilitates the deployment of rescue services.

Linking emergency lighting and lighting controls makes it easy to monitor emergency lighting systems. For example, the lighting management system can carry out regular, automated test runs, which are logged centrally in a test book. If a safety luminaire or escape-sign luminaire ever fails, the system will raise the alarm accordingly. This ensures maximum protection, especially in times in which we increasingly have to deal with scenarios such as power failures.

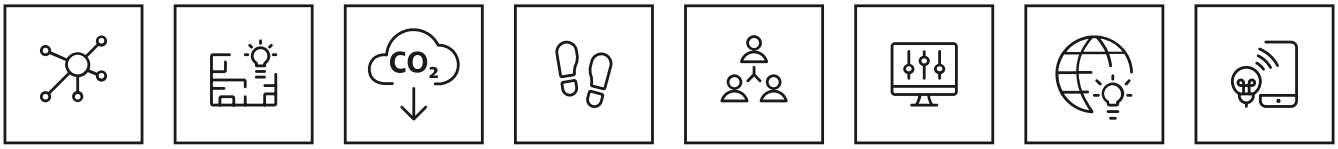
An integrated management system for general lighting and emergency lighting also offers financial benefits: the purchasing, commissioning and maintenance costs are lower for a joint system than for two separate ones. The amount of wiring can also be effectively reduced – without sacrificing comfort or safety.

			
RESCLITE	PURESIGN	COMSIGN	ARTSIGN
			
Emergency escape lighting with self-contained power supply	ONLITE local self-contained system	nBOX group battery system	ONLITE central CPS central battery system

DIGITAL SERVICES

Smart and future-proof educational buildings

Lighting infrastructure runs through entire buildings and is therefore the ideal platform for digital future technologies. Connected IoT solutions use sensors with building management software to further improve room usage. This networking of building services enables the monitoring of learning zone and room utilisation as well as air quality trends and other environmental parameters in the room.



OPTIMISE SPACE REQUIREMENTS AND USE ENERGY EFFICIENTLY

Zones in educational buildings often remain unoccupied at many times of the day or year. Sensors in the lighting infrastructure or in the luminaires themselves detect presence and automatically adapt the light. They also provide information on how frequently rooms are used. Library visitors can use an app to find free spaces for focused learning and reading.

ENSURE ENVIRONMENT QUALITY AND HEALTH

Even before the pandemic, there was a focus on air quality and hygiene in learning spaces. Learning processes benefit from well-ventilated rooms: because when students and teachers feel comfortable, they perform better. Air quality sensors can be used to measure values such as CO_2 content, air humidity and temperature as well as VOC values in order to monitor pollutants in the air. The system sends an alert when certain limits are exceeded or not reached, and action is required.

DIGITAL SERVICES FOR DATA-BASED USAGE MODELS

Zumtobel's Digital Services allow data that has already been collected from the primary or secondary school to be used to create added value. Across all sectors, big data can be transformed into concrete business and usage models – always tailored to the use cases in question. Educational architecture thus transforms into a learning ecosystem and, thanks to digitalisation and data analysis, continues to better adapt to students and teachers and their environment. Light becomes a starting point for connected buildings.

ALL-INCLUSIVE SERVICE

Smart and future-proof educational buildings
This Zumtobel service package places responsibility for the lighting design and all the work associated with it in reputable, expert hands.

The service includes the planning of a modern lighting system and the professional dismantling and environmentally friendly disposal of the existing lighting. The offer also includes turnkey delivery and installation of the new lighting system.

Financing models are an additional incentive. The new lighting system can be paid for in fixed monthly instalments. Zumtobel thus offers a holistic solution that covers all aspects of lighting, from design to implementation.

MONTHLY RATE.
PERFECT LIGHT.

SUSTAINABLE

Save on electricity costs, resources and CO_2 emissions thanks to efficient lighting technology that takes circular economy goals into consideration

DIGITAL

An uncomplicated path to modern infrastructure and digital services as the basic framework of a smart building

SECURE

Guaranteed certainty even in volatile times thanks to plannable costs and the individual adaptation of solutions with low capital commitment

INDIVIDUAL

Tailor-made worlds of light with the focus on people's needs

Our Services at a glance

SAMPLE CLASSROOM PLAN

Four planning examples for 24 learners	
Room size	70 m²
Room height	3 m
Normative requirements	EN 12464-1

Maximum absorption of information, increased concentration, well-being, motivation, greater attention. The focus is on good contrasts thanks to high illuminance levels, uniformity, especially on desks and blackboards/whiteboards, very good colour rendering, avoidance of psychological glare, friendly facial perception and modelling thanks to balanced shadowing. Light-coloured ceilings and walls also create a supportive room atmosphere. Using controls to vary the lighting mood helps counteract monotony.

MIREL EVOLUTION RECESSED LUMINAIRE:
EFFICIENT OPERATION

As a direct-beam solution, the MIREL family guarantees efficient energy usage. Conversion kits and standardised luminaire dimensions for common ceiling cut-outs and louvres offer the perfect toolbox for refurbishment projects.

12 MIREL evolution (dimming level 80 %) 2 Wallwasher FEW (dimming level 70 %)		
Connected load	277 W (4 W/m²)	
Modelling	0.44	
Working area	E_m 540 lx	U_0 0.78
Ceiling	E_m 159 lx	U_0 0.34
Walls	E_m ≥ 180 lx	U_0 ≥ 0.40
Board	E_m 750 lx	U_0 0.70
Psychological glare	UGR ≤ 16	

ECOOS II PENDANT LUMINAIRE:
FRIENDLY AND ECONOMICAL

As a single luminaire or in a continuous row arrangement, ECOOS is a family of luminaires specially developed for classrooms. High indirect light distribution ensures a stimulating and open room atmosphere for learning.

9 ECOOS II (dimming level 75 %) 2 Wallwasher FEW (dimming level 70 %)		
Connected load	448 W (6.4 W/m²)	
Modelling	0.5	
Working area	E_m 530 lx	U_0 0.75
Ceiling	E_m 266 lx	U_0 0.40
Walls	E_m ≥ 233 lx	U_0 ≥ 0.40
Board	E_m 822 lx	U_0 0.70
Psychological glare	UGR ≤ 19	

SLOTLIGHT INFINITY RECESSED LUMINAIRE:
ARCHITECTURALLY INTEGRATED AND STRUCTURING

The energy-efficient continuous light line blends subtly into the educational architecture. The Minicell reflector guarantees the required glare control with UGR ≤ 19 in accordance with EN 12464-1. SLOTLIGHT is a versatile kit with light and control options.

3 x 8 m SLOTLIGHT infinity minicell (dimming level 40 %) | 2 FEW (dimming level 70 %)		
Connected load	481 W (6.87 W/m²)	
Modelling	0.51	
Working area	E_m 504 lx	U_0 0.63
Ceiling	E_m 119 lx	U_0 0.51
Walls	E_m ≥ 150 lx	U_0 ≥ 0.40
Board	E_m 760 lx	U_0 0.75
Psychological glare	UGR ≤ 19	

LIGHT FIELDS III SURFACE-MOUNTED LUMINAIRE:
STUDENTS AND TEACHERS IN FOCUS

With a large-format, perfectly glare-free light-emitting surface and tunableWhite technology or Zumtobel SPECTRUM, LIGHT FIELDS helps create motivating learning environments – by stimulating and calming as well as stabilising the internal body clock.

9 LIGHT FIELDS III (dimming level 65 %) 2 FAW (dimming level 65 %)		
Connected load	400 W (5.71 W/m²)	
Modelling	0.42	
Working area	E_m 500 lx	U_0 0.79
Ceiling	E_m 163 lx	U_0 0.54
Walls	E_m ≥ 160 lx	U_0 ≥ 0.40
Board	E_m 677 lx	U_0 0.70
Psychological glare	UGR ≤ 19	

“We created a highly efficient customised product in an extremely short development period. It took just six months from the initial meeting with the architects at Reitmayr to delivery of the MIREL luminaires.”

Heimo Tastel,
Zumtobel project manager

WEISSKIRCHEN PRIMARY SCHOOL

Bright learning areas in a historical school building

Attractive areas for lessons using all the senses. Switching between closed classrooms and open spaces for co-creation and interactive learning – without traditional teaching approaches based on direct instruction. The extension and upgrade has allowed the Weisskirchen primary school in Steiermark to not only be reconfigured spatially but also conceptually. Open, educationally valuable architecture with steps, open spaces and reading galleries: there is now plenty of room for future-oriented knowledge transfer in the historical school building from 1895. The lighting solution supports the requirements of a modern learning environment. Zumtobel luminaires precisely meet users' needs in the different room areas and are also significantly more energy-efficient than the previous models.

CUSTOMISED LUMINAIRES IN JUST SIX MONTHS

The Reitmayr architects from Graz, who were in charge of the project, wanted an atmospherically appealing lighting solution with discreet aesthetics and high energy efficiency. It was also important to showcase the different learning zones in a task-oriented way and to find customised recessed luminaires for the new suspended ceilings in a wooden look. As a first step, Zumtobel adapted the LED recessed luminaire MIREL to the required ceiling measurements. "The architect wanted a cost-effective prism luminaire that would precisely fit the panel dimensions of the suspended wooden ceiling," recalls Heimo Tastel, project manager at Zumtobel. "This was a small challenge that we were able to solve with our Zumtobel in-house development team using a custom-made design." An LRO cover for maximum glare control in the classrooms was also needed.

More about the project

"Our school's lighting concept provides a sense of well-being for our pupils and forms the basis of a modern approach to education. With a perfect mix of daylight and artificial light, plenty of space and flexible furnishings, we can support different learning scenarios as required."

Hermine Hebenstreit,
Headmaster at Meiningen primary school

MEININGEN PRIMARY SCHOOL

New building for a cluster school concept

Large window fronts and skylights that let in plenty of daylight. A modern, geometrically shaped façade. Homely wood and muted colours. The new Meiningen primary school building in Vorarlberg is not just visually appealing, it also impresses with its modern educational concept as a cluster school. Here, individual educational spaces and classrooms are grouped around a central communal room – the "marketplace". This serves as an extended learning area, in which knowledge transfer across all age groups is possible.

THE RIGHT LIGHT FOR DIFFERENT VISUAL TASKS

Suitable luminaires were chosen for each of the different room areas to meet the varied visual task requirements: in the classrooms, the elegant LIGHT FIELDS III surface luminaire delivers evenly distributed, harmonious light. In the hallways, the slimline SLOTLIGHT infinity slim linear luminaire lights the way and provides orientation. And in the anterooms and foyers, round PANOS LED downlights create functional and architectural lighting that supports exchange and interaction within the space.

More about the project

"The JKU campus is a vibrant combination of urban architecture and landscape. It offers varied, stimulating spaces for interactions of all kinds … between people, between people and nature, between people and science …"

Peter Riepl, Architect

JOHANNES KEPLER UNIVERSITY LINZ

The campus as a space for learning, working and living

A successful concept attracts thousands of new students to the Johannes Kepler University (JKU) in Linz every year. The university is establishing itself as one of the best in Europe and, with the extensive redesign and redevelopment of the campus, is aiming to become even more attractive to students, teachers and academics. Following in the footsteps of the LIT Open Innovation Center and the Somnium viewing platform, the new welcome centre and the spectacularly renovated library are now open. Zumtobel has also played its part, working with the architects to develop the lighting solution.

SAFE, STRONG, BLACK – CUSTOMISED LIGHT LINE

Kepler Hall, a new welcome centre for the university with a total area of 3,000 square metres, serves as an auditorium, event centre as well as sports and multi-purpose hall. Despite the challenge of a ceiling height of 14 metres and low reflection values due to the glazing, Zumtobel was able to develop a special wide-beam light line based on the SLOTLIGHT luminaire, which achieves an illuminance of 500 lux for sports facilities.

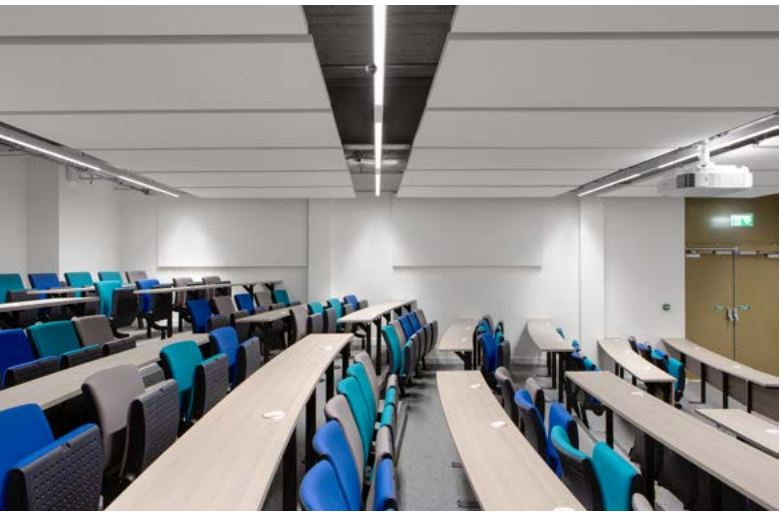
LIGHT-FLOODED MEETING ROOMS

The impressive redesign of the library, which is characterised by a 23-metre extension above the forecourt and additional elements such as a green atrium and a spacious open staircase, creates new spaces for research, learning and communication within the JKU Learning Center.

CUSTOM LIGHTING SOLUTION

Zumtobel supplied a custom lighting solution with MIREL continuous rows on TECTON trunking, which offers the perfect lighting conditions for different visual tasks in the library. In addition, the steel façade of the new building is spectacularly lit by the Thorn NIGHTSIGHT luminaire, giving the library building and the covered open space below an exceptionally welcoming atmosphere at night.

More about the project



LINCOLN MEDICAL SCHOOL, UNIVERSITY OF LINCOLN

The most sustainable building on the campus

Zumtobel has supplied a highly efficient new lighting solution to meet the requirements of the most sustainable building on the University of Lincoln campus and comply with stringent measures to reduce carbon emissions and power consumption for the new Lincoln Medical School.

JOINT LIGHTING SOLUTION BY ZUMTOBEL AND THORN

In collaboration with BAM Construction and with energy efficiency, aesthetics and low maintenance requirements in mind, Zumtobel and Thorn have created a stylish installation offering maximum performance for the building's interiors and using Zumtobel's MIREL luminaires on TECTON trunking, ONDARIA pendant luminaires and SLOTLIGHT infinity as well as Thorn's IQ Wave and Chalice LED luminaires.

CONSISTENT LIGHTING QUALITY

The opal, round ONDARIA pendant luminaires from Zumtobel were installed in the two-storey atrium of the main entrance to the medical centre. The diffuse and uniform light distribution and the discreet indirect light distribution for ceiling illumination create an inviting and atmospheric ambience. ONDARIA allows a completely flexible layout of the luminaires and blends perfectly into any room without compromising on the consistent quality of light.

TECTON SEAMLESS MULTIFUNCTIONAL TRUNKING

TECTON is equipped to meet the requirements of tomorrow: all functions such as power supply, lighting control and connection to emergency lighting can be seamlessly integrated into this multifunctional continuous-row system. The luminaires can be positioned flexibly and the system can be adapted to suit structural changes at any time. As most areas of the Lincoln Medical Centre have floating acoustic ceilings, the lighting installation had to be adapted to the ceilings. TECTON was therefore the perfect solution, as the system can accommodate the lighting without additional trunking.

More about the project

RESEARCH CO-OPERATION AALBORG UNIVERSITY COPENHAGEN

HERSTEDLUND SCHOOL, ALBERTSLUND (DK)
LIGHT AS AN INTERACTIVE, DYNAMIC ELEMENT OF LEARNING

The following motivational aspects should be included in the design of dynamic lighting systems for learning environments: supporting and structuring of learning activities, communication through lighting and student involvement, influencing of the activity level and learner behaviour, creation of an atmosphere through different light colours (note: technology tunableWhite), support for visual tasks and visual comfort. Light thus becomes a new, interactive tool for teachers. The right light intensity and colour at the right time also supports physical processes (Human Centric Lighting HCL) and thus promotes stimulation and recovery.

Aalborg University Copenhagen,
Prof. Dr. Ellen Kathrine Hansen
https://www.academia.edu/72485719/Dynamic_Lighting_in_Classrooms_A_New_Interactive_Tool_for_Teaching

DOUBLE DYNAMIC LIGHTING (DDL),
WELL-BEING THROUGH CONNECTION WITH DAYLIGHT

The results of this study show that dynamic lighting scenes that react to changes in daylight can be defined by a combination of direct and diffuse lighting. This study showed that DDL has a positive effect on the perceived room atmosphere, visual comfort and engagement compared to static lighting. A light source that is rather untypical in practice, which was directed narrowly onto the analysed surface, met with an excellent response. This scenario can be interpreted as a substitute for the sun. Summary for practice: the combination of directed light with spotlights (“sun”, e.g. spotlights/downlights) and diffuse light (“clouds”, e.g. wide- or indirect-beam surface luminaires) and the adaptation of lighting scenes to the daylight situation has a beneficial effect.

Aalborg University Copenhagen,
Prof. Dr. Ellen Kathrine Hansen
https://z.lighting/en/group/news-insights/zumtobel/double-dynamic-lighting/

STUDIES: LIGHT AND SUCCESSFUL LEARNING

Daylight is traditionally and scientifically recognised as making a positive contribution to performance, health, recovery etc. In 2021, the role of daylight in supporting learning processes was confirmed in a broad-based European study involving 2670 primary school children from 12 countries. The participants completed tests, were physically assessed and were allowed to make subjective judgements about the lighting environment. Questionnaires were addressed to both teachers and students.
Source: Daylight and School Performance in European School-children

The literature study referenced below deals with the influence of indoor lighting on the learning performance of students in relation to knowledge internalisation. The scientific results make it clear that lighting in learning environments should be optimised to promote learning performance and motivation. Researchers analysed the influence of light on the learning performance of 150 students in Malaysia. There is a significant correlation between the lighting quality and the pupils' learning performance. This finding is further supported by interviews with two experts.
Source: Effects of Light on Attention and Reaction Time: A Systematic Review

LITERATURE STUDY: CHANGING AND CONTROLLING LIGHT FOR SUCCESSFUL LEARNING

The literature study emphasises the importance of lighting in the learning process and summarises the following recommendations and findings: different lighting scenarios improve mental and visual comfort, while lighting scenes enable light to be adapted to different needs and tasks. Controlling communication with light supports concentration, discussion, movement and group activities, which in turn supports cognitive performance, especially in children with learning difficulties, to improve behaviour, learning ability and academic performance.
Source: Impact of Lighting on Children´s Learning Environment: A Literature Review

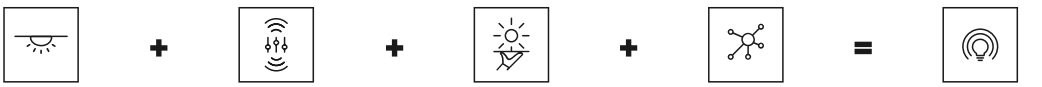
STUDY: LIGHT AND ENCOURAGING CREATIVITY IN THE LEARNING PROCESS

Creativity in learning processes gives a society a critical competitive advantage. Four analysed studies show that darkness and dimmed lighting can increase creative performance. Further research projects are uncovering the underlying mechanism involved and have established that darkness evokes a feeling of freedom. This triggers a risky, explorative processing style that contributes to creative performance. In addition, moderation analyses show the limitations of effects: the increase in creativity associated with darkness disappears when more informal indirect lighting is installed instead of direct light.
Source: Freedom from constraints: Darkness and dim illumination promote creativity

STUDY: SPECTRAL DISTRIBUTION OF LIGHT AND INFLUENCE ON SHORT-SIGHTEDNESS IN CHILDREN/ADOLESCENTS

The globally widespread problem of short-sightedness in childhood and adolescence is caused, among other things, by excessive growth in the length of the eye. This study complements the results of existing animal studies and provides new insights into the influence of light on eye growth and metabolism in the visual system. If these new findings prove to be transferable to humans, they will open up new potential starting points for optimising the spectral distribution of artificial light (note: see Zumtobel SPECTRUM) and light exposure. Light with a high blue component suppresses abnormal axial elongation of the eye, which leads to short-sightedness. In addition, the metabolic profiles in the vitreous body and retinas of the control group and test group are also dependent on the ambient light's spectral distribution.
Source: Ocular growth and metabolomics are dependent upon the spectral content of ambient white light

T H E L I G H T



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