

Das gute Licht

02 | 2021

Illumination in educational buildings

Balanced lighting design creates a pleasant learning environment, improves indoor and outdoor spaces and uses convenient light control where needed. We present solutions for all areas of learning: How light creates a sense of security and atmosphere.



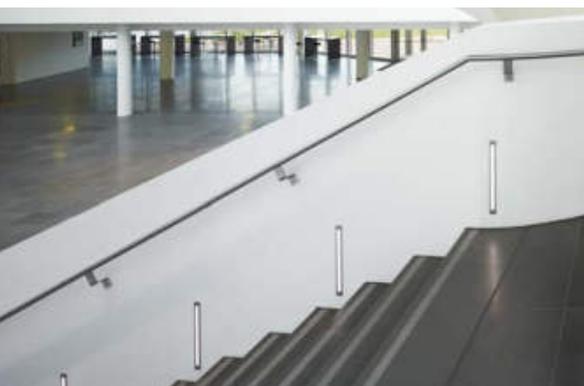
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Foreword

Dear reader,



It is time to look forward with greater optimism. This attitude characterises the latest issue of our magazine, “Das gute Licht”. This time, we have focused on the topic of educational facilities – one of society’s most important investments in the future of the younger generations.

The highly emotional, eventful and moving times of the coronavirus pandemic have taught us the value of respect. Above all, respect for the many victims – but also for a new order, which we must first learn to live with. This new order, with its safety aspects and changes in our behaviour, is an important reference point on the return to normality. We can all continue to do our bit. Meanwhile, immunisation is probably the most valuable and important aspect along the way.

Although a positive outlook was obscured for much of the recent past, I found the following comment from a psychologist to be very fitting: routines provide structure, stability and security in times of crisis.

Our routine has allowed our company to continue to serve as your reliable partner. Thanks to our organisational structures, deliveries have remained unaffected throughout these difficult times. Reliability is at the centre of our guiding principles.

We are directly committed to your wishes and interests. This has satisfied our customers in the past – and you can continue to count on us in the future.

Persistence is the attribute that most accurately describes our work in all disciplines. We are constantly expanding our portfolio, with the aim of providing the best solutions for your needs.

As a result, you can choose precisely the luminaire size, degree of illuminance and light distribution that you need for the respective application from our extensive product range.

We see our quality principles – including the sustainable production of durable lighting products, and our availability guarantee extending over many years – as unbreakable promises, which we have developed and maintained in your interest.

That brings us back to the initial starting point for the theme of this issue: Whether planning a new educational facility or redesigning an existing one, we offer outstanding lighting solutions for every possible lighting scenario in schools and universities. Thanks to the creativity of the architecture and our lighting products in distinctive designs, the result is not only efficient light control, but solutions that impress both the operator and the user of the building.

I hope you enjoy reading our magazine!

Heinrich Gantenbrink
Managing Partner

BEGA



Durable lighting design for outdoors and indoors

BEGA for educational facilities Efficient lighting and control with added value and unique selling points

Lighting in educational facilities has a significant influence on the learning ability and well-being of users.

One of the major factors in an exemplary educational facility is the quality of the lighting in combination with natural daylight.

Good lighting highlights and accentuates the architectural and spatial features – in and on new buildings, as well as in the renovation of existing buildings.

It offers the opportunity to create a pleasant and inspiring atmosphere that promotes well-being, something that should be taken into account during the planning phase.

Light is therefore a primary parameter of the design concept, effectively illuminating the architecture to create an environment where both teachers and students feel at home.

The BEGA portfolio for efficient lighting and light control in educational facilities offers added value, unique selling points and many years of effective benefits for our customers.

Our solutions provide school pupils, students and teaching staff with a pleasant learning environment. For building operators, architects, lighting designers and installers, we offer planning security and easy installation. The BEGA product range rests on several pillars:

· Everything from a single source for indoors and outdoors: Working with our luminaires,

media and services is characterised by efficiency and maximum user safety.

- Our extensive product portfolio offers a wide selection of luminaires for different architectural and structural requirements. This ensures an outstandingly agreeable environment.
- Reliability for daily routines: operational stability, durability, robustness, convenient maintenance and guaranteed availability – everything that is now promoted with the key word “sustainability” has long been a core part of BEGA’s quality principles.
- Pre-defined lighting scenarios can be selected with just one click, or the push of a button. BEGA technologies simplify and support light control in and around the building.
- BEGA products feature a distinctive design, and exceptional quality that far exceeds market expectations. They provide solutions for the specific requirements of the architecture and lighting design.
- Service beyond consulting, planning and after-sales support: Our availability guarantee is summarised on our website. There you will also find everything there is to know about our electronic components, our in-house LED technology and our expertise on light and illumination: www.bega.com ■



Contiweg School Building, Vienna, Austria

A robust upgrade for the outdoor spaces

Perfectly coordinated lighting design for schoolyards, play areas and pathways provides structure, creates atmosphere and guides visitors.

Creating open spaces for movement and relaxation: the campus, pathways and entrance areas provide the first impression of any educational facility. Successful planning meets demand for secure and attractive lighting, and provides structure in areas where it's easy to feel a little lost.

At the start of every lighting design process for schoolyards, play areas and pathways in educational facilities, there are clearly defined goals:

light is used for navigation and guides visitors to the entrances. It accentuates and elevates the first impression of the area. Light also has a signalling effect in the illumination of obstacles, such as stairs or individual steps. A feeling of safety during daylight hours and after dark is provided by the structuring effect, as well as the effective light output of the luminaires. In addition, animating light from spotlights can be used to highlight certain areas or playground equipment and bring a sense of vibrancy.

We deliver the solutions for the varied requirements of carefully coordinated illumination. Light control provides an even higher degree of user comfort, taking into account the following questions: Where is permanent lighting needed after dark? Are all the requirements for emergency lighting and safety lighting covered? Where would sensors and dimming of the light at night be suitable and helpful? How can self-explanatory and inviting visitor navigation be ensured – for example, during events? ▶



Tau Skole, Norway



The unshielded light of bollards and light building elements – as well as the shielded light of bollards if only the usable area is to be illuminated – provide many ways of guiding visitors to the entrances using the signalling effect of the luminaires.



Reliable lighting automation can be achieved by means of the standardised, easy-to-install and user-friendly DALI protocol (Digital Addressable Lighting Interface). Twilight switching, motion sensors, dimming of the luminaires and different lighting scenarios, e.g. for events, can be programmed in advance and selected at the push of a button.

BEGA offers a complete range of DALI luminaires, sensors, input devices and controllers from a single source. In addition, a KNX/DALI gateway can be used to integrate the light

control in a higher-level building management system.

We have compiled the most important information about the DALI system here: www.bega.com/dali

In energy-efficient renovations of existing buildings, when light points are already determined by the original planning, the broad BEGA portfolio allows the selection of luminaires with light distribution that is precisely coordinated to the usage area.

Another important issue regarding the use of luminaires in educational facilities is the risk of vandalism. That's why we use extremely robust and durable materials in the production of our luminaires. They are additionally protected by our highly effective technologies, ensuring that they are not only resistant to vandalism, but fulfil the added requirements in outdoor areas, i.e. dirt, weathering and temperature fluctuations. This protective package is a fixed component in our definition of quality, durability and low maintenance. ■

Quality for the schoolyard: Form-giving illumination and operational safety

The luminaires make a statement in the dark and contribute to the design of the welcome area and common room in many different ways.



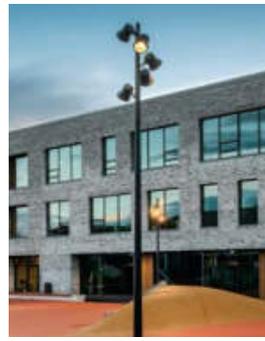
Vocational College, Geldern, Germany



Soft, uniform, unshielded light illuminates the schoolyard.



Asymmetrical flat beam light highlights pathways and guides visitors.



Targeted light beyond basic illumination accentuates important zones.



Symmetrical light provides expansive illumination of the different areas.

→ bega.com/km001

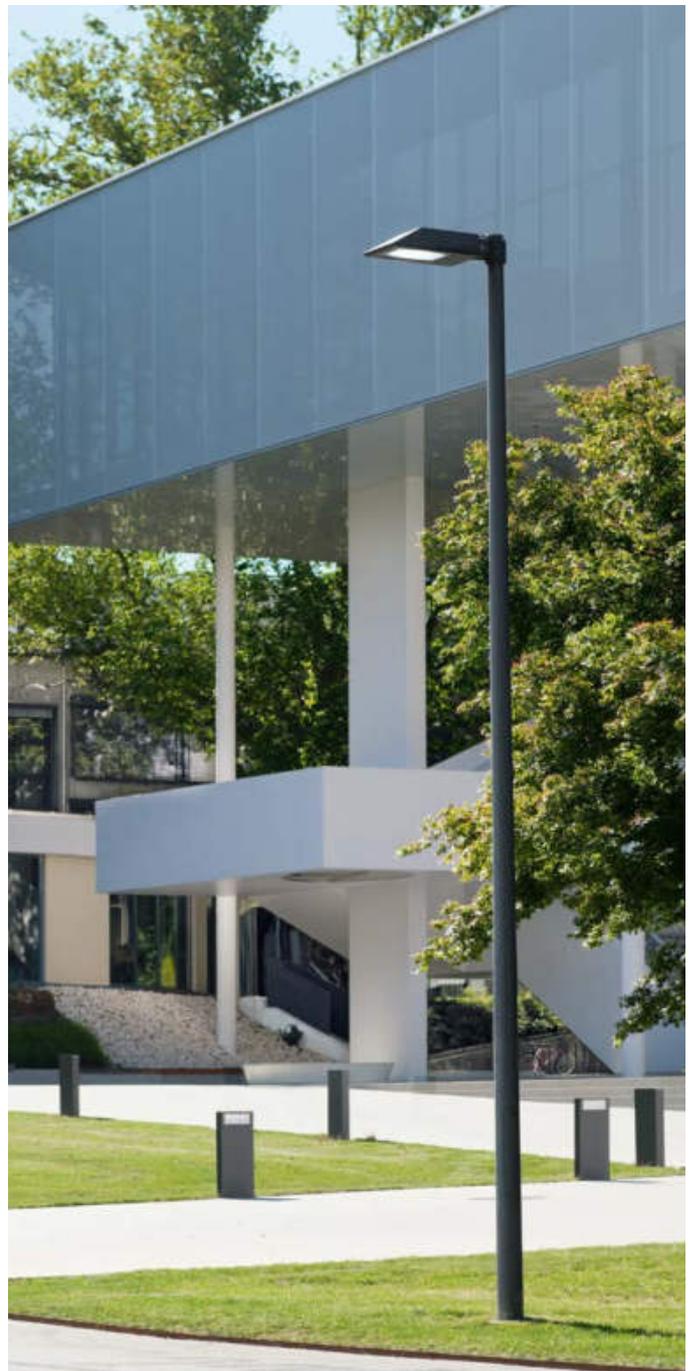
Luminaires for schoolyards and campuses need to meet many different requirements. Their light provides safety and orientation. They must be robust. They accentuate the lines of the architecture. Not only is the luminaire a statement feature, but so are the building and the open space that it illuminates.

Illumination in these areas should be controllable according to safety-related and energy-efficient criteria among others – taking into account the relevant standards.

Preset lighting scenarios can be selected with just one click, or the touch of a button for the purposes of general illumination, pathway navigation during evening events or needs-based lighting (dusk sensor, motion sensor). This simplifies and reduces the complexity of everyday life at the school or university.

BEGA luminaires fulfil every requirement in this area of application. Aesthetic quality and meticulous workmanship of the components are just two aspects of a complete package that combines sophisticated illumination, operational safety and low maintenance.

A high protection class of at least IP 65 protects the outdoor luminaires against water jets and dust. With easy-to-install, flexible illumination, integrated in a DALI control protocol, the schoolyard or campus becomes a welcoming space – with an exceptionally long service life. ■



Johannes Kepler University Linz, Austria

Magnetic effect of light aids orientation

A combination of indoor and outdoor lighting design effectively illuminates the entrance area of an educational facility.



C.A.R.L. Central Auditorium for Research and Learning, Aachen, Germany

Entrance areas of educational facilities should be easy to identify and welcoming in appearance.

Coordinated indoor and outdoor lighting design that complements the architecture is needed in order to provide orientation, as well as primary aspects of path safety and navigation.

The light emanating from the building after dark and the design of the lighting in the outdoor space combine to create an effective entrance area.

Connecting the different light sources via preset lighting scenarios or pre-defined illumination times guides the eye where it needs to go. Meanwhile, the light inside the building acts like a magnet on visitors.

Additional signposts

The more light illuminating the entrance area from inside the building, the more it makes sense to use subtle accent lighting outside to ensure basic illumination in accordance with the relevant standards. If light is cast outside, especially from the entrance area, it may be advisable to use structuring luminaires to guide the way, for example, and an additional signpost with shielded light to secure steps and round off the overall lighting design.

How much light is needed to illuminate the outdoor area and provide a feeling of safety, without taking away from the already illuminated entrance area?

These requirements can be coordinated with the available range of luminaires – also taking into account any existing light source locations. ▶

→ bega.com/km001



Providing orientation and utilising the light from indoors

The effect of bollards highlighting and securing the designated footpath can be seen from a long distance. Downlights aid orientation from the ceiling. The sparing use of outdoor light is logical, thanks to the large window fronts and the light that is cast from the inside out. ▶



Illuminating the architecture and utilising additional lighting effects

The spectacular, spacious stairs are not only illuminated by the light from inside the building, the bright ceiling – which is in itself a statement feature of this facility – draws additional attention to the stairs through the effective use of wide-beam, in-ground luminaires, thanks to the reflection of the light. ▶



Targeted use of light for clear illumination of the entrance area

The architectural features are generous and promising: a few light building elements with unshielded light are enough to illuminate the forecourt. The light colour of the façade serves as a reflection surface. The entrance itself is illuminated by the light cast from indoors and requires no additional illumination. ▶



Making targeted use of the reflective properties of the floor

Despite generous lighting from the interior, the entrances are explicitly marked with wall luminaires. They illuminate the courtyard using the light, reflective surface of the floor. Even without the generous interior lighting, the area is always well-illuminated as a result. ▶



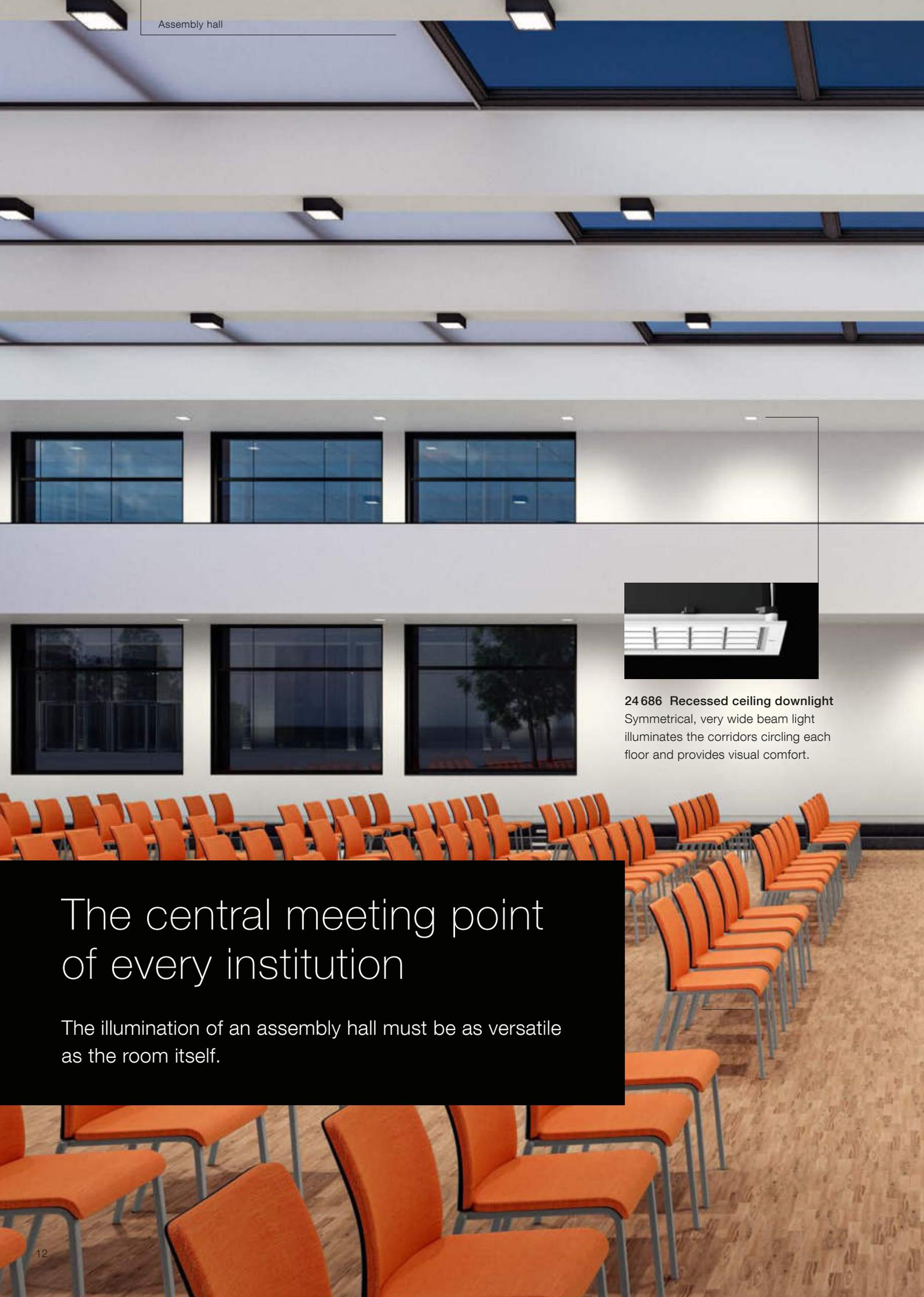
The signalling effect of the luminaires guides the eye and provides orientation

Recessed wall luminaires have a special signalling effect and guide the eye of the beholder to the entrance area. The visitor follows the distinctive, illuminated signposts on entering the school grounds almost automatically. ▶



Making use of materiality for efficient illumination after dark

The roofed area and light-coloured floor guide the eye to the entrance in daylight. In the evening, this function is performed by recessed ceiling luminaires, which take advantage of the reflective properties of the floor with their downward-directed light. This ensures clear orientation, even without illumination from indoors. ■



24 686 Recessed ceiling downlight
Symmetrical, very wide beam light illuminates the corridors circling each floor and provides visual comfort.

The central meeting point
of every institution

The illumination of an assembly hall must be as versatile
as the room itself.



24 067 Ceiling-mounted downlight
Symmetrical wide beam light distribution for pleasant, uniform illumination of the room can be used in addition to or in place of daylight.



51 067.1 Track-mounted zoom spotlight
Adjustable light distribution and orientation of the luminaires enables flexible accent lighting.

→ bega.com/km002



50 643.1 Large-area ceiling luminaire
Glare-free light and increased visual comfort for use as a separate classroom, as well as dimmability, tunable white and adjustable light temperature for use as background lighting during events, when the room is used as an extension of the stage.



33 019 Recessed luminaire for walls and stairs
Shielded light secures the stairs and visually delineates them from the assembly hall.

The quality and appearance of an assembly hall increase with the variability and quality of the illumination

The versatility of the assembly hall corresponds to its significance as the central meeting point of an educational facility. As an event venue for informal or cultural events, as a meeting room and even as a centre for teaching in small or large groups, no space covers such a broad spectrum of uses as an assembly hall.

Successful lighting is a central requirement for this gathering point. Besides basic illumination in place of or in addition to daylight, the second lighting design approach is to create lighting zones. The classic basic layout: The room is divided into the audience area and the stage and lectern.

For every use of the assembly hall, the same principle applies: the flexibility of this important space must be reflected with flexible lighting. The basic lighting of the room requires standard-compliant, pleasant, glare-free light that not only offers visibility but sets the tone as well. Combining different groups of luminaires to create different lighting effects can even further improve the appearance of the assembly hall.

At evening gatherings, a daylight atmosphere increases the attentiveness of audience

members. Tunable white luminaires can easily be integrated into the lighting design and illumination to this end. While the general lighting can be dimmed, floodlights or track-mounted zoom spotlights draw the necessary attention to what's happening on the stage. The alignment of the luminaires can easily be adjusted in advance.

RGBW luminaires can be used to create colourful lighting effects in the assembly hall to give performances a unique flair.

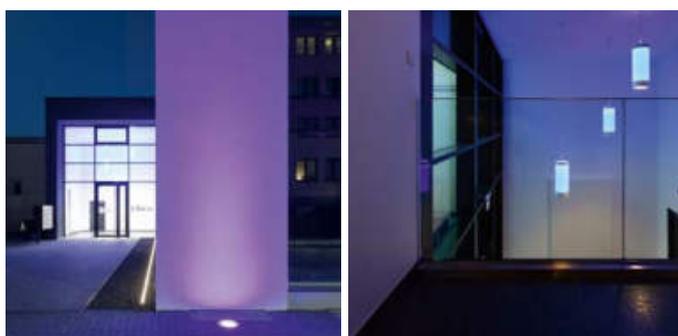
When integrated in a DALI control system, it's possible to pre-define different lighting scenarios. Convenient controls via a switch, pushbutton, PC or mobile device eliminate the need for additional stage technology, meaning the system can be used without major technical interventions or training.

Even when planning a DALI control system in an existing building, it's possible to use the existing conditions to your advantage – ceilings are often suspended, meaning the new five-core cables needed for DALI can be installed without a problem. ■

→ [bega.com/km002](https://www.bega.com/km002)

In daylight, the luminaires serve as both an accessory and an additional lighting option in the assembly hall. The preset lighting programme responds to low daylight levels and switches on the lights.

Soft, pleasant, unshielded light gives the assembly hall a warm glow in the evening. When pendant luminaires are combined with wall luminaires and recessed ceiling luminaires, the result is high-quality illumination befitting of this central meeting point. In addition, tunable white luminaires create a daylight-like atmosphere to increase attentiveness as needed.



The decorative effect of colourful accent lighting is a useful addition to basic illumination and gives performances in the assembly hall a unique flair. This is made possible by RGBW luminaires.



Herbart Gymnasium Assembly Hall, Oldenburg, Germany

Varied lighting design for the arteries of the building

Well-being from the outset:
how to make corridors feel inviting in an educational facility



Archiepiscopal Music School of the Cologne Cathedral Choir, Germany

Appropriate lighting that creates a sense of safety in the corridors of educational facilities provides accessibility, enables quick orientation, indicates escape routes during emergencies and highlights information areas.

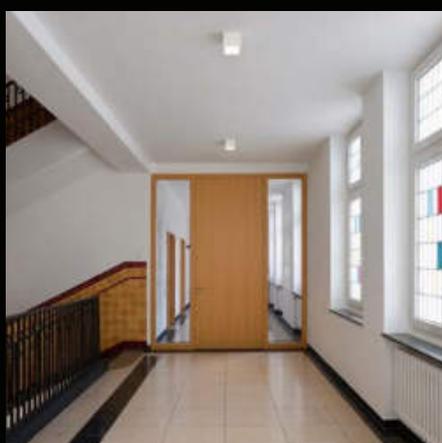
The corridors and staircases are the arteries of a building, and help users to find their way around the facility.

The lighting draws on the architecture and becomes a functioning part of the building, thanks to the interaction of shapes and light.

Alongside basic illumination, variety is achieved by indirect light, using ceilings and walls as reflection surfaces. When selecting suitable luminaires from the product portfolio, the amount of daylight should also be taken into account – different control options can

then turn on the lights only when needed. In low levels of daylight, or when people are present, the light output can be increased. This enables energy savings, without compromising on safety aspects.

When modernising existing buildings, replacing the luminaires offers significant potential for improvement, thanks to greater energy efficiency and control options. ▶



Precise illumination using optical systems of the highest lighting quality

Maximising the efficiency of light deflection can further improve the illumination of corridors in educational facilities. These surface-mounted ceiling luminaires feature patented BEGA Vortex Optics® technology. The twisted reflectors made of pure aluminium enable perfect light deflection with excellent visual comfort, thanks to intensive light bundling. The corridor and reflective floor are illuminated with precision when levels of daylight are not sufficient. ▶



Soft, uniform light from unshielded luminaires, attractively arranged in rows for basic illumination

The arrangement of the unshielded luminaires in rows draws on the length and symmetry of the corridor. Here too, the lighting can supplement the available daylight or replace it after dark. The soft, uniform light brightly illuminates the corridor – the luminaires are DALI-controlled, meaning they receive clearly defined, preset commands to provide dim, supplementary lighting or full lighting. ▶



Illuminating extraordinary architecture in harmony with the effects of light

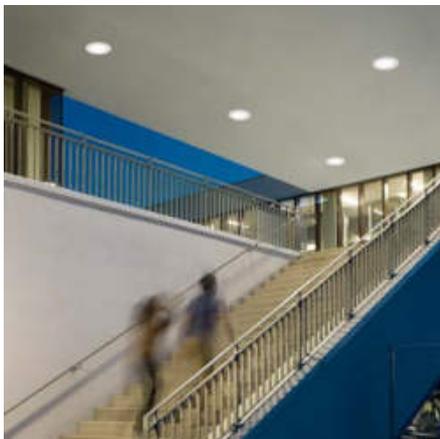
The satin matt floor in the corridor harmonises with the minimalist yet impressive concrete walls. Meanwhile, the lighting not only provides basic illumination from the ceiling, but also utilises the effect of the light from the recessed wall luminaires on the floor. Even in areas like these, without natural daylight, the adequate glare-free lighting provides a sense of safety and clear orientation. ■

Functionality meets aesthetics on staircases

Wide variety of lighting options and controls: flexible planning for different requirements is the central focus

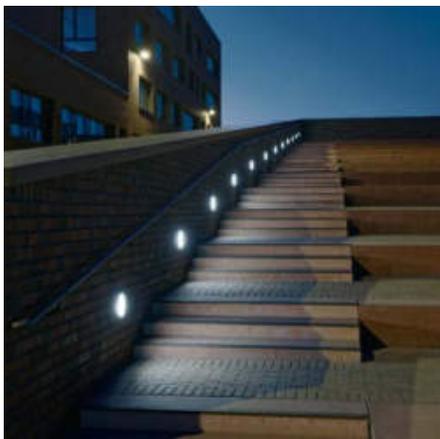
Light from the ceiling

Classic stairwell illumination from top to bottom: The directed light from the recessed ceiling luminaires fulfils safety requirements and generates an attention-boosting overall brightness. Meanwhile, the luminaires remain unobtrusive yet efficient lighting elements.



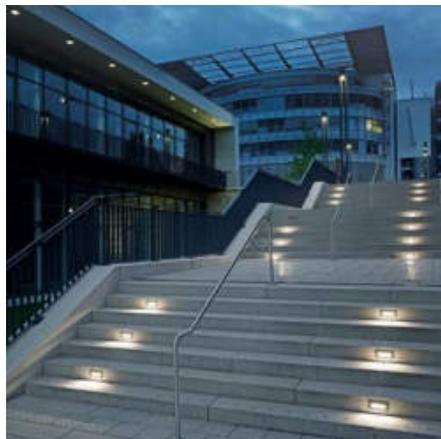
Light from the wall

Low-lying light from recessed wall luminaires is cast far across the stairs and provides users with a sense of safety. High contrasts increase attention.



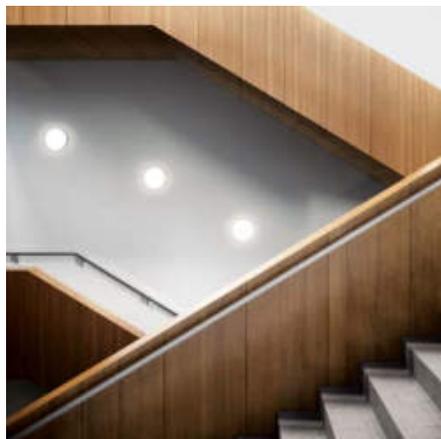
Light from the steps

The safety-promoting illumination of the steps and attractive aesthetic combine into an impressive lighting scenario, without subjecting the user to glare.



Light on the wall

Unshielded light, which is reflected from the walls, ensures excellent overall illumination of the stairwell. Arranged in a row, the robust luminaires draw on the lines of the architecture and the direction of the stairs. The result is a harmonious overall appearance.



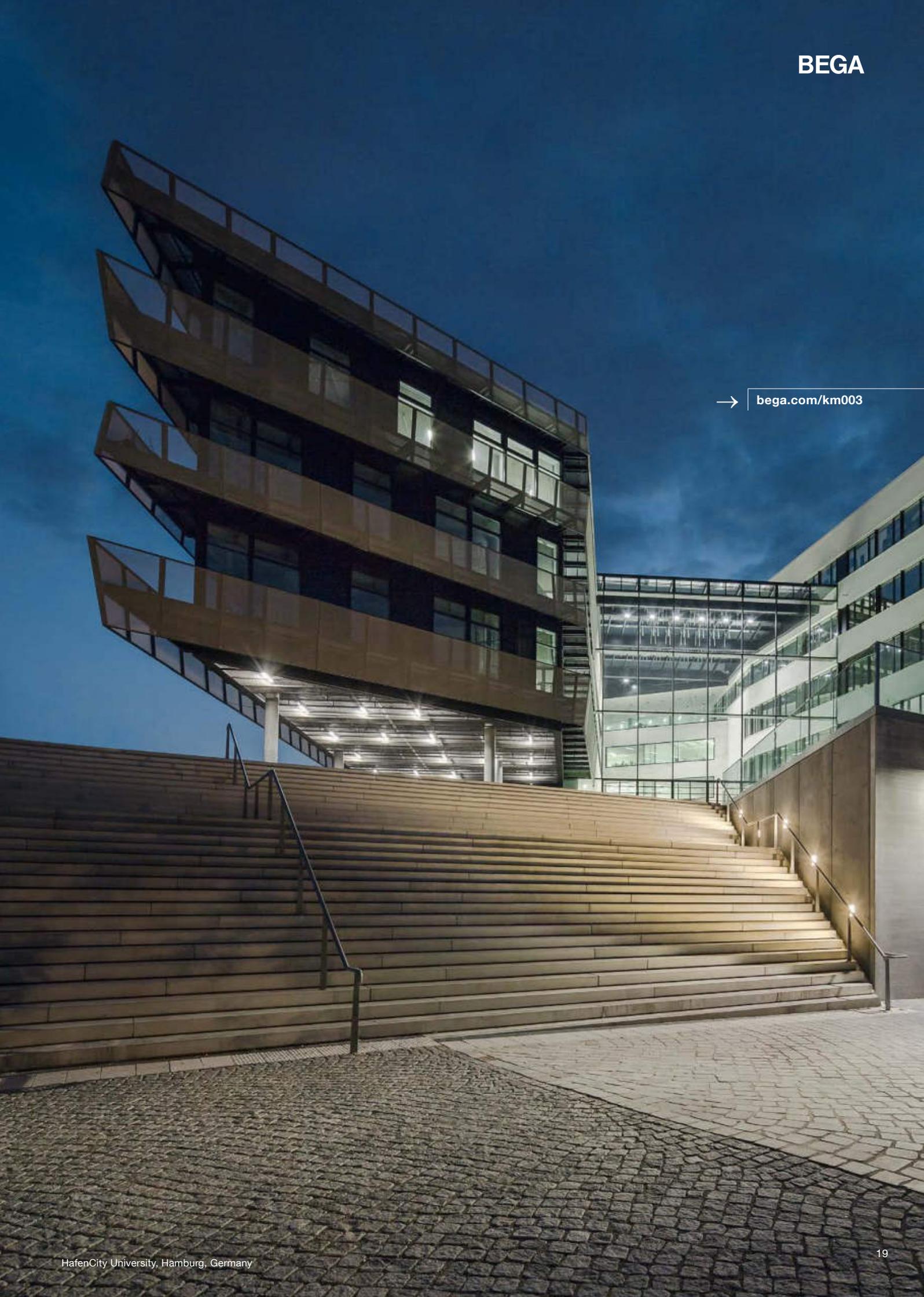
The requirements for the interaction between impressively designed staircases or minimalistic, functional staircases and the accompanying lighting are high. Safety and highlighting potential hazards, as well as adequate presentation of the architecture, all have a role to play in the illumination.

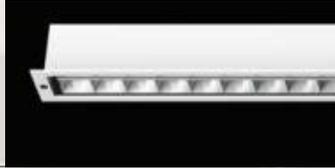
As the link between different levels of the building, staircases must attract the attention of the user. With high-quality lighting, they can be highlighted in a way that draws attention without causing a distraction. Staircases are open to a wide range of illumination

options: These include light on the ceiling, wall luminaires with unshielded light, recessed wall luminaires at different heights, light on the steps or impressive pendant luminaires to name but a few. They offer maximum design freedom when it comes to the rich and varied lighting of staircases in accordance with the relevant standards.

Different control options provide increased flexibility and allow architects, installers and lighting designers to attractively illuminate staircases, guide visitors, increase energy efficiency and respond to the level of foot traffic. ■

→ bega.com/km003





24 308 Recessed ceiling downlight

The asymmetrical, wide beam light distribution of these luminaires draws attention to the board, whiteboard or concept papers on the back wall of the lecture theatre.



24 564 Recessed ceiling downlight

The speaker takes the stage: When the general lighting is dimmed or switched off, the lectern and its immediate surroundings are illuminated by symmetrical, wide beam downlights with a half beam angle of 56°.



An attractive learning environment

Focused work and comfortable learning are a question of lighting

Teaching and learning formats are becoming increasingly flexible. An attractive learning environment meets the needs of this dynamic and adapts to different communication formats. In spaces used for teaching, lectures or training; lighting

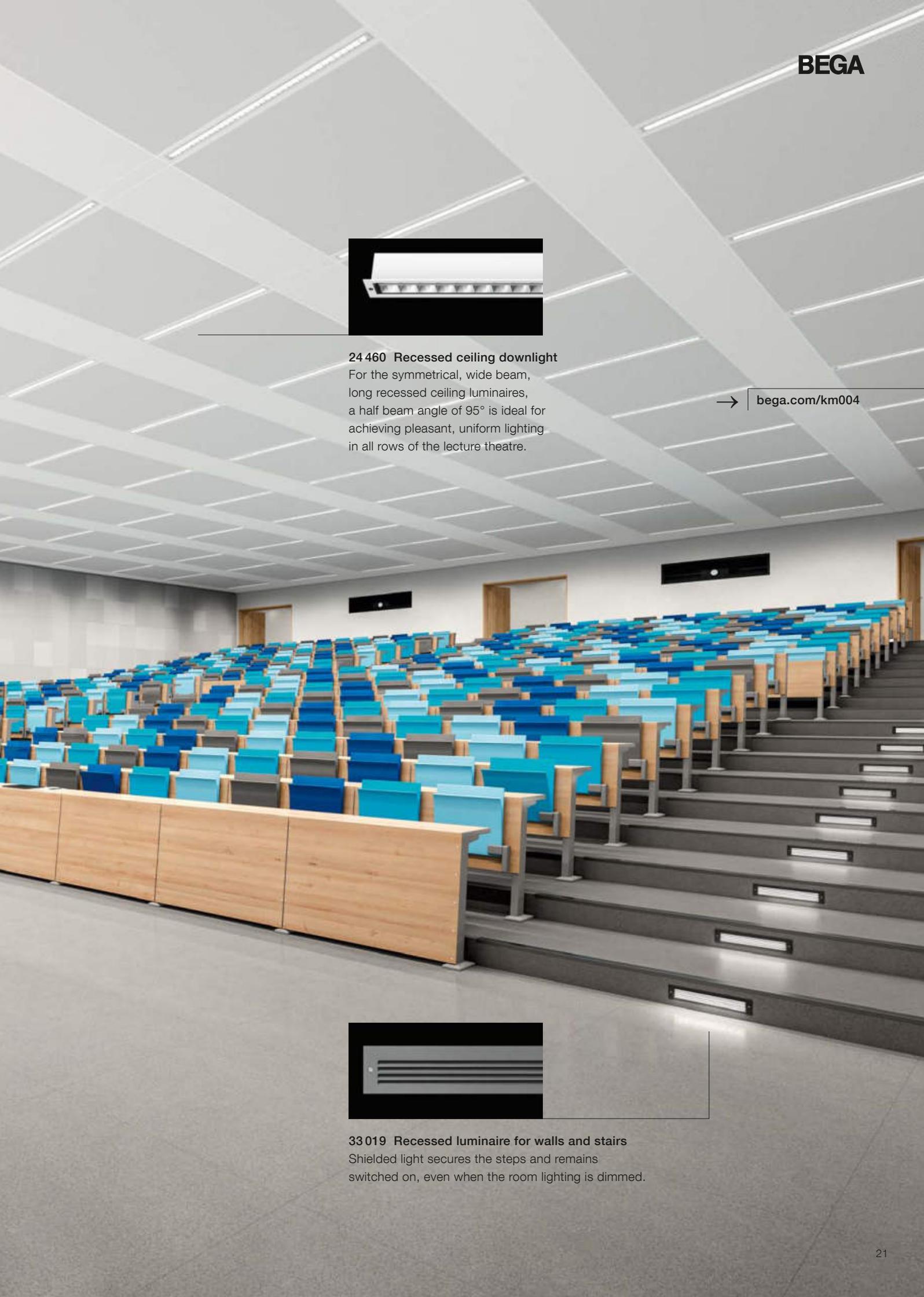
comfort, reading comfort and learning comfort go hand in hand. Therefore, focused work is also a question of lighting. The unique features of every room and its lighting can be taken into account with various luminaires and light distributions. ■



24 460 Recessed ceiling downlight

For the symmetrical, wide beam, long recessed ceiling luminaires, a half beam angle of 95° is ideal for achieving pleasant, uniform lighting in all rows of the lecture theatre.

→ bega.com/km004



33 019 Recessed luminaire for walls and stairs

Shielded light secures the steps and remains switched on, even when the room lighting is dimmed.

Lighting designs for different teaching rooms: ideas for new buildings and renovations



The huge potential of luminaires enables multiple different lighting scenarios for different requirements

When it comes to pendant luminaires, a single lighting design can facilitate many design options. As well as unshielded light, the luminaires feature a very wide beam downlight and an additional upper light emission. Three lighting scenarios form the basis for the illumination of the lecture theatre: The permanently switched-on downlight provides visibility and visual comfort in the auditorium. The additionally connected, unshielded component allows even brighter illumination of the room. The additional upper light emission rounds off the homogeneous overall lighting concept. The DALI-controllable lighting design is easy to operate and control. In the RGBW version, the luminaires create exciting coloured lighting effects in the auditorium. ▶



Renovations: using DALI with five-core cables – installed in the suspended ceiling

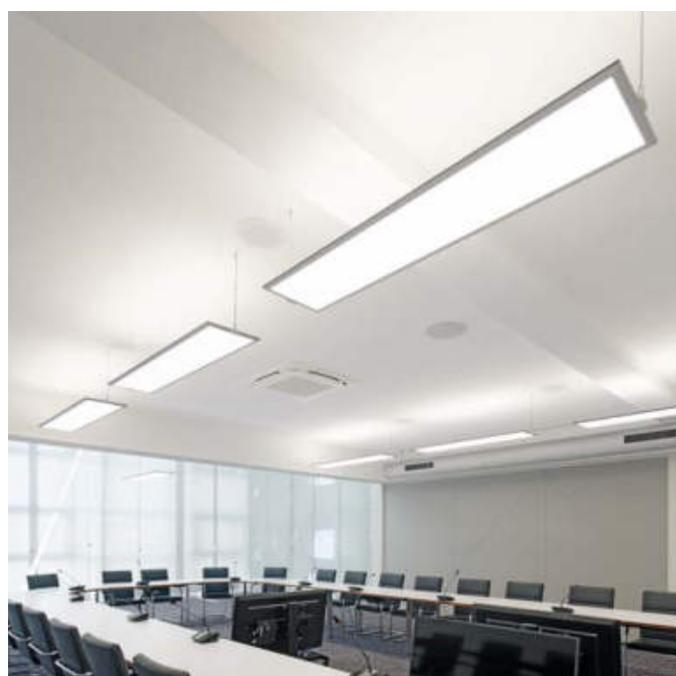
Lighting in existing classrooms and teaching spaces can be made fit for the future with only a few targeted measures. Suspended ceilings can be very helpful when it comes to modernisation. Not only do they facilitate the replacement of the luminaires; they also allow the simple installation of cables with at least five cores for DALI control systems above the ceiling. Surface-mounted ceiling luminaires or recessed ceiling luminaires can then be easily controlled to create a pleasant atmosphere in the classroom. The luminaires feature patented BEGA Vortex Optics® technology. Together with BEGA's own LED modules, the twisted reflectors made of pure aluminium enable perfect light deflection with outstanding visual comfort. Easily accessible lighting control provides added convenience. ▶

→ bega.com/km004



BEGA luminaires in historic buildings: modernisation using energy-efficient LED lamps

Preserving old and even historic building structures and classic interiors does not mean the existing lighting cannot be made more energy-efficient. Thanks to their outstanding durability and sophisticated, timeless design, BEGA luminaires continue to function like new in their area of application, even decades down the line. In order to significantly reduce energy costs and enable even more efficient illumination of existing luminaires, it may be worth looking into switching to LED technology. BEGA Support can answer any questions of this nature and provide information about technical feasibility. ▶



Pleasant light without disruptive shadows: large-area luminaires with indirect light

What makes a perfect classroom? Glare-free light and high visual comfort are a must. The technical features of the large-area luminaires in the FLED series provide exactly that. The optical system consists of micro-structured, light-deflecting layers that are precisely tailored to the LED module. The pendant luminaires and ceiling luminaires each come in two different versions: luminaires with 100 % direct light distribution and – where additional lighting of the ceiling or the area directly above the luminaires is required – luminaires with 70 % direct and 30% indirect light. ■

Illuminated architecture at Florida Polytechnic University



Illuminating architecture and highlighting its statement features – the development, design, production and further development of every BEGA luminaire pursues this same end goal. The “References” section of our website presents selected projects from around the world. There you will find inspiration from outstanding architecture and the accompanying lighting solutions, organised into eight categories. The project at Florida Polytechnic University is an exceptional example of an impressive educational facility with excellent lighting solutions.

www.bega.com/km005

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