

Press release

Light as a learning aid: needs-based lighting in schools

A modern, dynamic lighting solution in schools creates a learning environment that can already take into account future needs and a wide range of requirements. Four Zumtobel projects demonstrate just how successful school lighting renovations can be. The company's versatile lighting solutions create a pleasant atmosphere that encourages focused learning and working, while also saving up to 60 per cent energy – and with a short amortisation time, too.

Dornbirn, 9 July 2020 – Our perception of school and education is changing: learning can be fun! Classrooms are becoming living spaces. Feeling good and performing well are no longer contradictions in terms, but are understood to be cause and effect. Added to this is increasing digitalisation, which poses new challenges for existing infrastructure. Renowned lighting specialists [Zumtobel](#) from Dornbirn, Austria, and their innovative lighting solutions are helping to create modern, efficient environments for new learning concepts and digital equipment – with lighting that can do much more than simply provide light. Dynamic light structures the lesson and adds variation and variety to the school day. The light is also influenced by seasonal differences in daylight and the spatial layout of the classrooms. There are three factors at the heart of every lighting solution: excellent flexibility thanks to state-of-the-art technology, an improved room atmosphere that creates a better learning environment, and maximum energy savings.

Top marks in energy balance

The rewards for investing in a first-class LED lighting system include both better light and low maintenance and energy costs. The [Volksschule Herrenried \(primary school\) in Hohenems](#) (Austria) is a fine example of an energy efficiency upgrade of a school building from the sixties, supplemented by a new wing. The then visionary learning environment still offers the perfect room structure for today's teaching methods – for whole-class groups, group work or concentrated individual work. There is now no difference in quality between the existing class wing and the adjacent new building. Zumtobel's [MIREL evolution](#) glare-free luminaire family integrates efficiently into the environment of the new building. The renovated building also benefited from efficient integration. Using the ceiling grid of the existing lighting system, it was possible to replace all the existing louvre luminaires with fluorescent lamp technology in the refurbished rooms. Compared with traditional luminaires with 4 x 18 fluorescent lamps, economical luminaires like MIREL evolution can reduce energy consumption by more than 60 per cent. And when combined with control units and sensors, even more energy can be saved. Special optics and high luminous fluxes also help keep purchase costs low as they enable bigger distances between luminaires, which means fewer

luminaires are required, depending on the room situation. A further cost-based argument is the long life time of the LED lighting, which reduces the need for replacement and maintenance.

Daylight creates a favourable learning atmosphere

In addition to improved energy efficiency, intelligent lighting solutions are also characterised by a pleasant room atmosphere that supports concentrated, disruption-free working and learning. The **Höhere Technische Lehranstalt TGM Wien** uses a flat LED ceiling luminaire with a bright ceiling aesthetic that acts like a natural skylight. As a second-generation LED luminaire, Zumtobel's [LIGHT FIELDS](#) micro-pyramidal luminaire guarantees highly efficient, glare-free and homogeneous lighting. A look-out sensor detects the incident light in order to automatically control the luminaire groups that run parallel to the front of the window, depending on the amount of daylight. Three predefined light scenes can be selected at the simple push of a button on the [CIRCLE](#) control point at the entrance to the room. Six and a half years is all it takes to amortise an investment in a new lighting solution. The use of LED lighting fixtures in combination with a daylight-dependent control and presence-detection system could reduce energy consumption, maintenance costs and therefore also CO2 emissions by around 50 per cent.

Maximum flexibility means increased well-being and better concentration

Alongside relevant research results, several studies looking at better light in classrooms form the basis for the development of Zumtobel's lighting concepts. For example, researchers at Aalborg University Copenhagen developed new design criteria for light scenes in the classroom, which Zumtobel subsequently implemented. With the help of the lighting infrastructure and the [LITECOM](#) lighting management system, the partners collected several months of data on light use at the [Herstedlund Primary School](#) in Albertslund, Denmark. Light is intended to be used as a structuring and interactive element in the classroom. Zumtobel's *Active Light* concept supports teachers and pupils with different light scenarios for learning – by using different colour temperature and illuminances, the lighting automatically reproduces the dynamics of daylight, supporting the body's natural biorhythms. With the help of Zumtobel's **tunableWhite technology**, for example, the amount of white in the light can be individually adjusted according to daylight and requirements. Depending on the lesson and time of day, bright, bluish light, which inspires feelings of openness, or reddish light, with its more discreet, private feel, encourages pupils to either communicate, carry out concentrated work, be creative or relax. A lighting management system allows the pre-programmed lighting scenarios to be easily controlled by the teaching staff. The colour settings and light intensity of all the luminaires in the classroom can be individually adjusted.

Light offers more freedom

The closer a form of light comes to imitating the characteristics of daylight, the more invigorating its effect on people. Another example of a successful lighting concept is the new [primary and secondary school in Hard](#) (Austria), usually known as the "Schule am See". It is known for its innovative pedagogical and architectural approach, in which the lighting solution also plays its part.

The new building by architects [Baumschlager Hutter Partners](#) is designed as a cluster school, in which each of the nine identical clusters is a small school in itself. A cluster structure enables the creation of partially autonomous socio-spatial units in large schools, which are manageable for pupils and teachers and help them feel at home. At the same time, the architectural principle allows many freedoms, including the freedom to reconfigure the individual rooms at any time and the freedom to teach and learn everywhere. The lighting solution developed specially for this project contributes hugely to the use of these freedoms. At first glance, no luminaires can be seen. The secret? Ultra-streamlined, white [PICO LED](#) light lines in **tunableWhite**. Integrated in a uniform grid flush into the white exposed concrete ceiling, they initially look simply like structuring strips. Thanks to micro-faceted downlight technology and recessed LED light points with high-gloss reflectors, they nevertheless enable optimum luminous efficacy and glare-free light. Customised daylight linking colour temperatures between 2,700 and 5,700 Kelvin are adapted to the biorhythms of teachers and pupils, thus improving well-being, attention and concentration. The lighting solution thus also contributes to a progressive, needs-based learning environment. “Teachers and students often aren’t aware of what creates the unique atmosphere in our school”, says head teacher Christian Grabher. “But it’s down to the successful interplay of architecture, lighting and interior design. And the learning spaces, which, thanks to the glass façade, the glass partitions and the invisible but powerful luminaires, are light and airy.”

Info box

Zumtobel offers four planning scenarios that can be used as a basis for creating customised lighting for any school building. All four solutions include blackboard lighting with MIREL evolution wall washers as well as a daylight and motion-dependent lighting control system (DIMLITE school KIT or basicDIM Wireless).

- 1 BASIC: MIREL evolution, an easy-to-install, highly efficient luminaire based on a modular system
- 2 PERFORMANCE: [MELLOW LIGHT](#) evolution for daylight-like lighting with separately controllable direct/indirect shares and Crystal Optic
- 3 ADVANCED: [ECOOS II](#), a 360°-beam luminaire, which provides perfect glare-free light for computer workplaces even at high luminous fluxes
- 4 PROFESSIONAL: [LIGHT FIELDS III](#) offers glare-free light from every angle – from a frameless luminaire that is particularly easy to clean thanks to its smooth surfaces

Zumtobel also offers [DIMLITE](#) school Kit, a lighting control system adapted for use in schools, which uses available daylight and presence-dependent lighting control. [basicDIM Wireless](#) provides a wireless alternative that enables any classroom lighting system to be modernised and controlled without the need for additional wiring. For both variants, the relevant sensors and control points are also available directly from Zumtobel.

Captions:

(Photo credits: Zumtobel)



Image 1 + 2: Zumtobel's [MIREL evolution](#) glare-free luminaire family integrates efficiently into the environment of the new and the renovated building of **Volksschule Herrenried in Hohenems**.



Image 3: The **Höhere Technische Lehranstalt TGM Wien** uses a flat LED ceiling luminaire with a bright ceiling aesthetic that acts like a natural skylight



a)

b)



c)

Images 4a (3000K), b (4000K), c (6000K): Light is intended to be used as a structuring and interactive element in the classroom at **Herstedlund Grundschule**.



Images 5 + 6: The architectural principle of Volks- und Mittelschule in Hard allows many freedoms, including the freedom to reconfigure the individual rooms at any time and the freedom to teach and learn everywhere. The lighting solution developed specially for this project contributes hugely to the use of these freedoms.

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About Zumtobel

Our passion is to create quality lighting solutions that deliver total perfection. We are driven by a conviction that the right kind of light can create the right atmosphere in a building at any time of day or night. When tailored to people's individual needs, light becomes something of an experience. We are always exploring new ways to come up with inimitable and timeless designs and are inspired by a unique creative ambition. When working on the lighting of tomorrow, we are driven by our innovative corporate philosophy of continuously improving the aesthetics of light. With passion, a sense of beauty and a forward-looking approach, we are constantly seeking to use light to help improve people's quality of life. The Zumtobel brand is part of Zumtobel Group AG, based in Dornbirn in the Vorarlberg region of Austria.

Zumtobel. The Light.