

LIGHT FOR HEALTH AND CARE



ZUMTOBEL



Light for Health and Care

Hardly any other application area demands such complex lighting solutions as health and care facilities, where an extremely wide range of requirements have to be met in order to create perfect conditions: doctors and care staff need different lighting situations in order to perform tasks that require high levels of concentration. Efforts are also made to achieve a feel-good atmosphere for patients. Lighting therefore has to cater for the needs and preferences of various groups of individuals in different situations. Zumtobel's intelligent lighting solutions reconcile these disparate requirements and interests.

Thanks to extensive research, we know how light can affect mood and well-being. Our product development and consultancy work take into account the results of international research studies. The primary purpose of lighting in hospitals is to improve the quality of the patient's stay, thereby also aiding recovery. The emphasis in care facilities is on using light in the right way to improve quality of life, for example to compensate for inadequate daylight by providing dynamic lighting solutions that mimic changes in daylight over the course of a day. Innovative technologies and intelligent controls also minimise energy consumption. This is how Zumtobel strikes a balance between lighting quality and energy efficiency.

Zumtobel. The light.

Applications



St. Franziskus Care Home, Marsberg | DE



Mäldegem Care Home | BE



Rüsselsheim Clinic | DE



Hamburg-Eppendorf University Clinic, Hamburg | DE



Gmunden Regional Hospital | AT



Elisabeth Residential Care Facility, Breda | NL



Dr. Martin Ladentrog Dental Practice, Graz | AT



Offenbach Clinical Centre | DE

References

Bad Soden Cardiac Centre, DE | Bregenz Regional Hospital, AT | Brothers of Mercy Hospital, Salzburg, AT | Cantonal Hospital Basel, CH | Caritas Socialis Vienna, AT | Centre Hospitalier, Mouscron, BE | Children and Pediatric Hospital, Dammam, SA | Chur Hospital, CH | CHUV Maternity, Lausanne, CH | Constance Clinics, DE | Dornbirn Hospital, AT | Elisabeth Residential Care Facility, Breda, BE | Erasmus MC, Rotterdam, NL | Franz-Tappeiner Hospital, Merano, IT | Fujairah Private Hospital, AE | General Hospital, Biljurashi, SA | General Hospital, Sakaka, SA | Geneva University Hospital, CH | Gmunden Regional Hospital, AT | Göttingen University Clinic, DE | Graz Regional Hospital, AT | Gynaecological Clinic, Lucerne, CH | Hamburg-Eppendorf University Clinic (UKE), DE | Innsbruck Regional Hospital, AT | Klagenfurt Regional Hospital, AT | Liesing Geriatric Centre, AT | Lippe Detmold Clinical Centre, DE | Maldegem Care Home, BE | Marien-Hospital, Witten, DE | Marienkrankenhaus, Hamburg, DE | MCRZ Rotterdam, NL | Medicity Gurgaon, IT | Minden Clinical Centre, DE | Oberaich Centre for Care of the Elderly, AT | Offenbach Clinical Centre, DE | Ospedale Trento, IT | Ospedale Verona, IT | Paracelsus Clinic, Osnabrück, DE | RSA G. Frisia, Merate, IT | RSA Mazzali, Mantova, IT | RSA Morelli Bugna, Verona, IT | RSA Selvazzano, Padova, IT | Salzburg Regional Hospital, AT | St. Georg Municipal Clinical Centre, Leipzig, DE | St. Katharina Vienna, AT | St. Pölten Regional Hospital, AT | Szpital Wojewodzki, Slupsk, PO | Triemli Municipal Hospital, Zurich, CH | Twente Universiteit, NL | UZ Ghent, BE | Vienna General Hospital, AT | Wroclaw Hospital, PL | Zollikerberg Hospital, CH

Cover picture: Dornbirn Care Home | AT

Architecture: Consortium

Johannes Kaufmann Architektur – Riepl Riepl, Dornbirn | AT

Lighting solution: PANOS downlights, SLOTLIGHT light lines



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Study results

St. Katharina, Vienna

Everyone needs a certain amount of daylight. Elderly people who suffer from dementia and live in a care home often get too little natural light. This disrupts their sleeping and waking patterns. There are no strong dawn/dusk phases to provide cues for their body clock and they find it very difficult to establish a settled sleep routine. This is where an intelligent lighting solution can help to make a significant contribution to patients' and care staff's sense of well-being.

St. Katharina Residential Care Home, Vienna | AT

Architecture: Peretti + Peretti, Vienna | AT

Lighting solution: CIELOS luminous ceiling, MELLOW LIGHT IV recessed luminaires, VIVO spotlights, 2LIGHT MINI downlights, KAVA LED RGB wall-mounted luminaires, LUXMATE PROFESSIONAL lighting management system



A recent research project conducted at Vienna's St. Katharina residential care home provides the latest evidence confirming the effectiveness of artificial lighting. This project, carried out by the Centre of Lighting Expertise, was funded by the Austrian Ministry for Labour and Social Affairs. A project network that included partners such as Osram, Bene Consulting and Zumtobel made a crucial contribution towards the success of this study. The study made it possible to use new findings about the biological effect of light to stabilise residents' sleep-wake rhythms. In order to achieve this, controllable, wide-area luminaires delivering variable illuminance levels and light colours were installed in the ceiling area in one care home residential block, which provided several static and dynamic lighting situations that could each be selected for at least eight weeks over a period of an entire year. Care home residents were interviewed and various measurements were made in order to investigate the effects of artificial lighting on residents' behaviour and state of health.

The study revealed that residents and care staff alike responded especially positively to 1500 lx (8000 K) light, which had effects in a very wide variety of areas. A more restful sleep phase with fewer sleep interruptions was observed, for instance. Some of the residents who had been anxious during the day became calmer, and there was a significant improvement in communication. Even involvement in domestic activities increased. Quality of life in old age is becoming an increasingly explosive social issue.

The experts are confident that follow-up projects and in-depth studies will enable them to unearth even more statistically meaningful evidence. Purchasing a lighting solution of the kind used in this project is roughly 5 times as expensive as standard lighting – equivalent to about one euro per resident per day. However, over several years, this cost is significantly less than that of sleeping pills and psychotropic drugs that would otherwise be used to ensure a better night's sleep. Ultimately, however, added value in terms of patients' quality of life is paramount.



Trends

Light for Health and Care



Healthy and active

Quality for patients and persons who require care

Modern society attaches increasingly greater importance to good health. This trend is reflected by constantly growing demand for good health and an ageing population, and both these developments place new requirements on lighting. The number of people who require care is set to rise sharply in future years in most countries. Confronted with this new situation, hospitals and care facilities now face the task of upgrading their capacities and standards to meet state-of-the-art demands.



Reliable and functional

Support for doctors and care staff

Healthcare is currently in a state of constant flux. Technologies and methods are becoming more sophisticated and more complex. Workflows are becoming increasingly automated and assisted by modern media. Medical staff are expected to deliver tip-top performance round the clock. Although simply having the right lighting can't work wonders, it can bring about decisive improvements. When light is used intelligently, work processes not only become safer and more reliable. Using light intelligently also significantly improves doctors' and care staff's capacity for work and boosts their motivation.



Ecological and economical

Added value for operators and investors

Hospitals and care facilities operate 24 hours a day throughout the year. Consequently, they consume lots of energy and this is an important cost factor given current hikes in electricity prices. Saving energy also means cutting CO₂ emissions. Ecology and economy are current topics of public debate. Against a background of increasingly fierce competition, environmental awareness offers companies a great opportunity to stand out from their competitors. Operators and engineers alike are interested in solutions that reduce energy consumption and cut costs in the long term.

Healthy and active

Quality for patients and persons who require care

“It’s especially important that dementia sufferers feel safe and secure. Everything must be done to make sure they do. Sufficient light of the right quality helps give dementia sufferers sense of safety and security. Circadian light helps establish a good day-night rhythm and reinforces the “interplay” between day and night. It can also improve sleep quality and daytime wakefulness. This can make nursing and care a more positive experience for both patients and staff.”



Michael Schmieder
Director | Sonnweid Care Home, Wetzikon | CH



Kittsee Care Home | AT

Architecture: Arch. Prof. Ing. Mag. Heinrich Wolfgang Gimbel, Oberwart | AT
 Lighting solution: LIGHT FIELDS surface-mounted luminaires,
 PURELINE bedside luminaires, SCONFINE SFERA pendant luminaires,
 SLOTLIGHT light lines, ONLITE COMSIGN LED escape sign luminaires,
 ONLITE RESCLITE emergency luminaires, LUXMATE BASIC lighting control
 system

Demographic changes in most European countries mean that the numbers of elderly people who will need care is set to rise sharply over the next few decades. The elderly have different needs. Lighting design must take this fact on board and take it seriously in order to enable the elderly to lead autonomous lifestyles. Eyesight deteriorates drastically with age, 3D perception grows worse and sensitivity to glare increases. Insufficient daylight disrupts sleep-wake rhythms. Freedom of movement also becomes restricted with age. Lighting can be used to respond to these altered requirements, thereby redefining residents' and patients' quality of life. Higher lighting levels make it easier for patients to see, even when performing simple visual tasks, and uniform illuminance levels ensure greater safety, especially in corridors.

1 Healthy and active

Structuring time

- **The right lighting helps synchronise biological rhythms and works in harmony with them**
- **Colour temperature and lighting intensity can mimic those of natural daylight over the course of a day**
- **Nature is the perfect model for pleasant, refreshing lighting**

Besides its functional and emotional components, lighting also has a non-visual, biological effect on humans. Light also provides an important time base for circadian sleep-wake rhythms. However, due to restricted mobility or unfavourable building layouts, there is often no easy access to daylight in hospitals and care facilities. Biological rhythms are quickly thrown out of balance, which has an impact on well-being and productivity. The elderly, in particular, have an innate need for larger amounts of light and, when there is not enough daylight, they experience night-time insomnia. This can cause unease and anxiety which make them less active and adversely affect well-being.

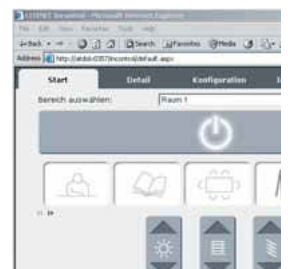
This phenomenon is especially pronounced in the case of patients suffering from Alzheimer's or dementia. Studies conducted in various care homes show that high lighting levels in day rooms have a positive, stimulating effect on sleep-wake rhythms. Lighting levels up to 1500 lx are recommended at certain times. Colour temperatures that mimic natural changes over the course of a day have a positive impact. Warm light in the morning and evening fosters a sense of well-being and relaxation. Bluish light in the late morning and at midday has a stimulating effect. This daylight feel makes care patients more mobile, more active and more communicative. These increased activity levels result in the body producing more melatonin in the evening; this makes residents feel tired in the evening and therefore more likely to get a good night's sleep. This provides better "cues" for the body clocks of elderly people in a way that they have become accustomed to during their active working lives.

High-quality lighting is also effective in hospitals, especially in intermediate and intensive care units. We perceive light subconsciously, and it ensures well-balanced biological rhythms. Natural light in waiting areas and patients' rooms creates a sense of ease and promotes subsequent patient convalescence and health.

Product recommendations

CIELOS multicolor |
Surface-mounted luminaire

LUXMATE LITENET | Lighting management





Helios Care Home Goldach | CH
Architecture: F. Bereuter AG, Rorschach | CH
Lighting solution: special-design luminaires



1 Healthy and active

Increased well-being

- **Lighting scenes that feature variable light intensities, directions of light and light colours create feel-good atmospheres**
- **Light and materials can merge into a single entity, thus lending even sterile spaces a homely note**
- **Individually adjustable daylight integration speeds up patient convalescence**

Patients' rooms play a crucial role in the recovery process. The right light can make a perceptible contribution towards making patients feel secure and at ease, despite being in an unfamiliar environment. A pleasant atmosphere also leaves its mark on doctors who provide treatment, care staff and visitors.

Light becomes a feel-good factor if the light colour, direction of light and its intensity are appropriate to particular situations and produce various room scenes: at visiting times, communicative lighting with daylight-like, natural light and well-balanced light distribution has a highly agreeable effect. In contrast, a more muted lighting scene is fine for reading. Simple, intuitive operation makes sure that even people with reduced mobility and physical and psychological health problems can operate the lighting system with no difficulty.

A light colour that interacts with the furniture, materials and colour schemes in the room periphery gives a room a homely feel. This is the approach that is also adopted by products that integrate light and a medical supply system in a wall-mounted system that hides the technology from view. Premium products are also distinguished by time-saving installation and easy operation for lighting control that integrates daylight and delivers the desired lighting scene at the press of a button.

Product recommendations

IMWS | Medical supply system

ZBOX | Lighting management





AK Seligenstadt near Frankfurt, Asklepios I DE
Lighting solution: IMWS integrated medical wall-mounted system

1 Healthy and active

Improving convenience

Casa di Cura privata "Sanatrix", Rome | IT

Architecture: STA Nervi-Feliciangeli, Rome | IT

Lighting solution: LIGHT FIELDS surface-mounted luminaires, CIELOS luminous ceiling, SLOTLIGHT light lines, ONLITE RESCLITE emergency luminaires, LUXMATE BASIC lighting control system



- **Well-balanced luminance levels are perceived as pleasant**
- **Daylight has a natural, agreeable effect**
- **Simple operation is a basic requirement**

Well-balanced luminance levels are easiest achieved by using several light components: luminaires with visible luminance levels, for instance, are an ideal addition to vertically illuminated surfaces and help improve human spatial perception. Adequate luminance levels are required in meeting areas to ensure straightforward orientation and safe movement. The fact that corridors are places where people meet and communicate in many hospitals, retirement homes and care homes and are frequented by many patients with impaired vision is a powerful argument in favour of a high-quality lighting solution. The legally required minimum illuminance in corridors is therefore inadequate. In corridors, Zumtobel recommends luminance of around 300 lx with special attention being paid to uniformity.

Light and a sense of well-being are always closely linked. If insufficient daylight is available, artificial lighting must compensate for this and provide optimal illumination with high levels of visual comfort. While daylight is inherently variable, an intelligent controller is required to be able to adapt artificial lighting to suit the time of day. In areas that are used by the public, an automatically adjusted lighting level is perceived as being pleasant. In contrast, individuality needs to assert itself in spaces used by individuals such as patients' rooms. Logical, simple operation that even the elderly, frail or visually impaired and dementia patients can understand is the top priority in these situations.

Product recommendations

PERLUCE | Surface-mounted luminaire

ONDARIA | Circular luminaire



Maldegem Care Home | BE

Architecture: AIKO Architecten & Ingenieurs, Maldegem | BE
 Lighting solution: PANOS downlights, COPA pendant luminaires, SLOTLIGHT light lines, CLARIS pendant luminaires, KAREA wall-mounted luminaires

1 Healthy and active

Ensuring safety

- **Patients and staff alike can find their way round more quickly**
- **Avoiding glare means preventing accidents**
- **Uniform brightness enhances lighting comfort**

Besides the way that space is divided up and interior design, lighting and luminaires are important factors when it comes to ensuring straightforward orientation in buildings. The elderly are especially susceptible to glare and this can have negative consequences under some circumstances. Glare reduces a person's perception of their environment. A good lighting solution that takes into account surfaces and their reflectiveness precludes the possibility of glare.

Uniform brightness makes potential danger spots clearly visible. It helps negotiate shadowy or dark areas which the elderly are prone to regard as trip hazards. Good lighting becomes more important as we age. This is why the brightness levels specified by standards and regulations are not sufficient to ensure requisite levels of safety in care facilities. This safety can only be achieved through a well-balanced, bright lighting scene. Emergency and escape sign luminaires that are easy to identify from afar and brighten up a room sufficiently in an emergency make finding an escape route safer and faster.

Product recommendations

ONLITE ERGOSIGN |
Escape sign luminaire



SLOTLIGHT II | Recessed luminaire



Gmunden Regional Hospital | AT

Architecture: fasch&fuchs architekten, Vienna | AT

Lighting solution: PANOS downlights, TECTON Tetris continuous row system, SLOTLIGHT light lines, RAIN moisture-proof luminaires, PURELINE bedside luminaires, CONBOARD medical supply units, LUXMATE LITENET lighting management system



Reliable and functional

Support for doctors and care staff

“After a familiarisation period that lasted around 2 to 3 weeks, the new integrated medical wall-mounted system made our work significantly easier. Connecting medical supplies and medical equipment is better and easier to monitor than before. Consistent operation and a standard lighting situation is a particular advantage when working nights. The orientation night light installed laterally behind the head ensures that patients now enjoy an uninterrupted night’s sleep; this was not always the case when we used a conventional end-of-the-bed solution. Cleaning staff reckon that cleaning and disinfection can be completed faster and monitored more effectively than in the case of surface-mounted units. The design of the media wall helps provide an environment that is highly appreciated by staff and patients alike. The entire interior design brings a calming feel and a hotel-like atmosphere.”



Ingrid Fleckeisen
Nurse | AK Seligenstadt near Frankfurt, Asklepios | DE



Offenbach Clinical Centre | DE

Architecture: woernerundpartner, Frankfurt | DE

Lighting solution: PANOS downlights, SLOTLIGHT recessed luminaires, LINARIA batten luminaires, ARCOS spotlights, CLEAN SUPREME cleanroom luminaires, CONBOARD medical supply units, PURELINE surface-mounted luminaires

In nursing and care settings, one of the most important requirements is to ensure that all workflows everywhere run smoothly at all times. Responsibility for patients and making sure they are safe are paramount. Modern technologies and methods are shaping health care and are also making new demands on lighting. Imaging diagnostics requires low lighting levels, for instance. At the same time, glare-free light and extremely good colour rendering are needed in order to be able to identify details and colours with high contrast.

Operations and treatment are now frequently performed at night for capacity reasons, in emergencies and for economic reasons. Night shifts and round-the-clock working are routine in hospital and care settings. This has an adverse effect on staff's sleep-wake rhythms. However, the right light can boost alertness and activity levels. It helps ward off fatigue without any harmful effects on health.

2 Reliable and functional

Making work easier

- **Functional, glare-free lighting is indispensable in workplaces where there are exacting visual requirements**
- **Emotional accent lighting provides welcome contrasts in sterile environments**
- **Lighting scenes at the push of a button increase convenience for both patients and staff**

Examination and treatment areas are primarily designed along functional lines. Emphasis is placed on usage, workflows and medical and technical equipment. Electronic displays on monitoring equipment, mechanical adjustment controls and computers are now all standard. Generally speaking, this calls for a well-balanced lighting level, good colour rendering and absence of glare in much the same way as in office workplaces. High-quality lighting solutions prevent distracting reflections and glare on the surface of equipment, on monitors and on x-ray image viewing equipment. Lighting systems with direct/indirect light distribution and the right light colour meet these requirements very capably and provide an agreeable room ambience. This is something that is also highly appreciated by patients. Spotlights or downlights provide positive lighting accents that accentuate architecture.

Emergency cases, examinations and treatment or room cleaning: the diverse range of purposes for which treatment and examination rooms are used demands individually adapted lighting scenes – at the push of a button. Many application areas involve particular visual requirements that demand higher lighting levels than those provided by general lighting. It is advisable to use systems that are especially flexible, mobile and deliver exclusively direct light in such areas. Specific, less brightly lit areas with light levels lower than those of the general lighting system are possible.

Product recommendations

LIGHT FIELDS |
Surface-mounted/pendant luminaire

CIRIA | Control unit



Dr. Fahrenholz Dental Practice, Vienna | AT

Architecture: Architectural engineer Josef Schiessl, Vienna | AT
Lighting solution: LIGHT FIELDS surface-mounted luminaires





Dr. Martin Ladentrog Dental Practice, Graz | AT

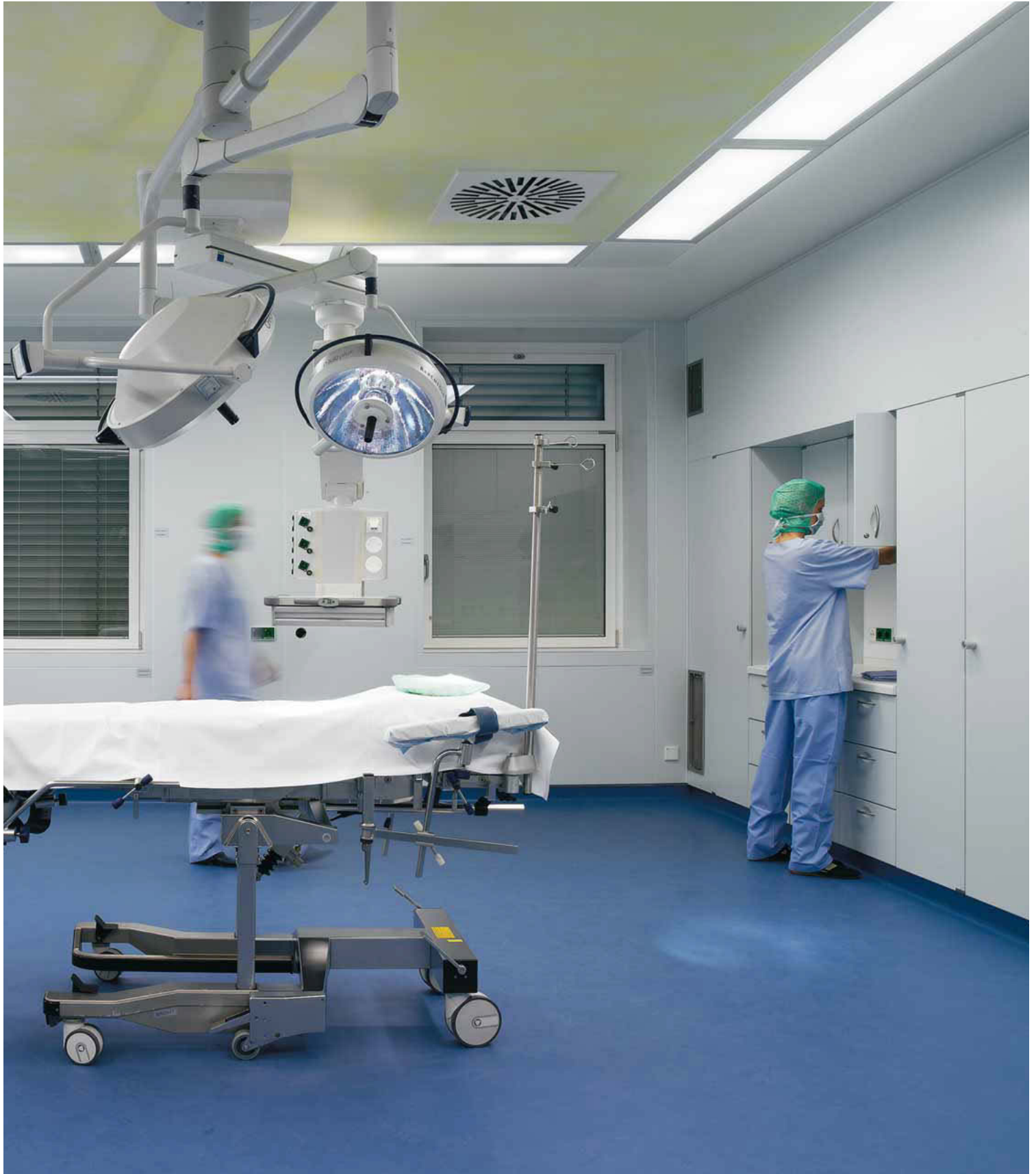
Architecture: H. Fritz, technical office for interior design, Graz | AT

Lighting solution: LIGHT FIELDS surface-mounted luminaires,

KAVA wall-mounted luminaires, SLOTLIGHT light lines

2 Reliable and functional

Recognising details



- **High, uniform illuminance creates ideal working conditions**
- **Lighting scenarios can be adapted to suit particular activities**
- **Proper lighting combats fatigue**

The range of operations performed has grown significantly in recent years. Dimmable lighting solutions that provide various lighting scenarios have long been a standard feature. It is taken for granted that operating theatres are uniformly illuminated with high illuminance levels. An average lighting level of 2000 lx is recommended in order to assist visual adaptation.

Minimally invasive operations are nowadays often performed using green light lasers requiring low illuminance levels. Heavily dimmed light makes it easier to assess contrasts on monitor displays. Nevertheless, the surgeon's eyes have to constantly adapt to different light levels and this causes fatigue. There is often insufficient daylight in operating theatres. This makes it hard for medical staff to remain alert and attentive. Varied light can help prevent this. Coloured lighting scenes of the kind produced by RGB-controlled LED luminaires visually lift a room, for instance. Lighting concepts that feature variable colour temperatures respect the qualities of daylight, aid concentration and improve well-being. Scrupulous hygiene requirements explain the huge importance attached to maintenance and cleaning work. The expense this involves can be reduced significantly by installing powerful, efficient LED cleanroom luminaires. This makes it possible to boost cost-effectiveness and sustainability at the same time.

Product recommendations

CLEAN ADVANCED | Cleanroom luminaire

CLEAN SUPREME | Cleanroom luminaire



Gynaecological Clinic Freiburg | DE

Architecture: Gaiser u Partner, Karlsruhe | DE

Lighting solution: PANOS downlights, FEL recessed luminaires, FEC recessed luminaires, CLEAN cleanroom luminaires, PURELINE surface-mounted luminaires, TECTON continuous row luminaires, STARFLEX fibre-optic system

2 Reliable and functional

Taking time into account

Bolzano Central Hospital | IT

Architecture: Ing. Claudio Scanavini, Bolzano | IT
Lighting solution: ACTIVE LIGHT WALL luminous ceiling, PURELINE lighting and supply system, CLARIS II surface-mounted luminaires, PERLUCE diffuser luminaires, LUXMATE PROFESSIONAL lighting management system



- **Constantly working day shifts and night shifts makes people tired and leads to mistakes**
- **Slowly resetting the human body clock makes night work easier**
- **Higher light intensities boost staff's activity and alertness levels**

Working night shifts is par for the course in hospitals and care facilities. Staff who are on duty are always expected to be active and alert. Mistakes must be avoided at all cost because they can have devastating consequences. Nevertheless, human biorhythms are not designed for night shift working. Pulse rate and body temperature automatically decrease at night. Avoiding constant changeovers between working early and late or daytime and night-time shifts has beneficial effects. Erratic working hours disrupt the body's natural rhythms and result in sleep disturbances and poor concentration. For people who work shifts, it is therefore a good idea to adjust their internal clock. As in the case of jetlag, this takes a few days. The right lighting assists this adjustment. High light intensities suppress the production of melatonin and ensure alertness when on duty. Nevertheless, high intensities must be used carefully. Lighting control that adjusts light intensities flexibly and ensures smooth transitions between corridors and patients' rooms makes working easier and makes sure that patients are disturbed less frequently. Visual comfort improves when the eye does not have to accommodate to abrupt transitions between bright and dark environments.

Product recommendations

PANOS INFINITY Tunable White | Downlight

LUXMATE EMOTION | Touch panel



Gmunden Regional Hospital | AT

Architecture: fasch&fuchs architekten, Vienna | AT

Lighting solution: PANOS downlights, TECTON TETRIS continuous row system, SLOTLIGHT light lines, RAIN moisture-proof luminaires, PURELINE bedside luminaires, CONBOARD medical supply units, LUXMATE LITENET lighting management system

2 Reliable and functional

Being flexible

- **Modular lighting and medical supply units adapt flexibly to suit the way a room is being used**
- **Modular lighting solutions meet all needs comprehensively, from medical supply units in patients' rooms through to lighting in underground car parks, and even across different projects**
- **Intelligent lighting control adjusts light to suit the visual requirements of the patient or doctor at the press of a button**

Lighting design starts at the spatial planning stage. For instance, once it is known how many beds there will be or where monitors will be located in an operating theatre, it is easier to think about where to place light switches. Thinking along modular lines is a tried-and-tested lighting approach. Individually designable medical supply units for patients' rooms turn lighting into an integral part of a room. Concealed from the patient, technology is discreetly hidden behind a cover or side edge.

Including lighting control in plans at an early stage ultimately provides greater scope for flexibility. "Light on demand" is the watchword of modern lighting solutions. Lighting is adjusted to suit a particular visual task at the push of a button and is ideally supplemented by daylight sensors and presence detectors or an automatic timer. It is important that user interfaces are simple. The wide variety of different lighting scenes that are available will only be used if operation is simple. Additional scenes can be developed retrospectively for intelligent lighting solutions in order to optimise the energy efficiency or economic efficiency of a building, for instance.

Product recommendations

CONBOARD NP | Medical supply system

LUXMATE DIMLITE | Lighting management



Hamburg-Eppendorf University Clinic, Hamburg | DE

Architecture: Nickl & Partner Architekten, Munich | DE

Lighting designer: Ebert und Partner, Nuremberg | DE

Lighting solution: CLARIS surface-mounted luminaires, CLEAN cleanroom luminaires, ONLITE escape sign luminaires, PERLUCE diffuser luminaires, CONBOARD medical supply system, CUREA bedside luminaires, PANOS downlights, TECTON continuous row luminaires, SLOTLIGHT light lines



Marienkrankehaus Hamburg | DE

Architecture: Henke + Partner, Hamburg | DE

Lighting solution: CLEAN ADVANCED, CLEAN SUPREME and CLEAN CLASSIC cleanroom luminaires, PURELINE lighting and control units, TECTON TETRIS continuous row luminaires, PANOS downlights, MELLOW LIGHT IV recessed luminaires

Ecological and economical

Added value for operators and investors

“Above all, life-cycle costs will be a decisive criterion for the future design of lighting installations. Features such as durability, energy efficiency, easy installation and maintenance make a real difference. A combination of energy-efficient luminaires and optimised control provide considerable scope for potential energy savings. In my opinion, the cost of ownership of a luminaire after 25 years is what counts.”



Herbert Feurstein
Chief Technical Officer | Regenz Regional Hospital

**Campus Biomedico di Roma | IT**

Architecture: Studio Architetti Associati, Pesch. Borromeo | IT
Lighting solution: COPA high-bay luminaires, PANOS downlights,
MELLOW LIGHT IV recessed luminaires, CONBOARD lighting and
supply units (special design)

The various reference groups involved, from patients to investors, place different requirements on lighting concepts. Great emphasis is put on the health and well-being of persons who require care and care staff. Lighting is also a matter of cost, especially the annual maintenance and electricity costs that are incurred in order to run the lighting system. Energy-efficient planning right from the outset lays the foundation for achieving sustainable success. Daylight-based control and individually retrievable lighting scenes are an integral part of such planning. They make it possible to improve convenience while cutting energy consumption, thus providing a solution that delivers long-term satisfaction.

3 Ecological and economical

Reducing energy consumption

- **Efficient luminaires and light sources reduce energy consumption considerably**
- **Intelligent lighting control switches light off when it is not needed**
- **Upgraded or modernised lighting solutions are a more economically efficient solution overall**

Hospitals and care facilities with several hundred beds use large amounts of energy for heating, ventilation, air conditioning, lighting and operating medical equipment. The needs of patients and staff have to be met round the clock. This means that older buildings, in particular, and their supply systems and technologies are no longer fit for purpose by today's standards. The result: high energy consumption and excessive costs.

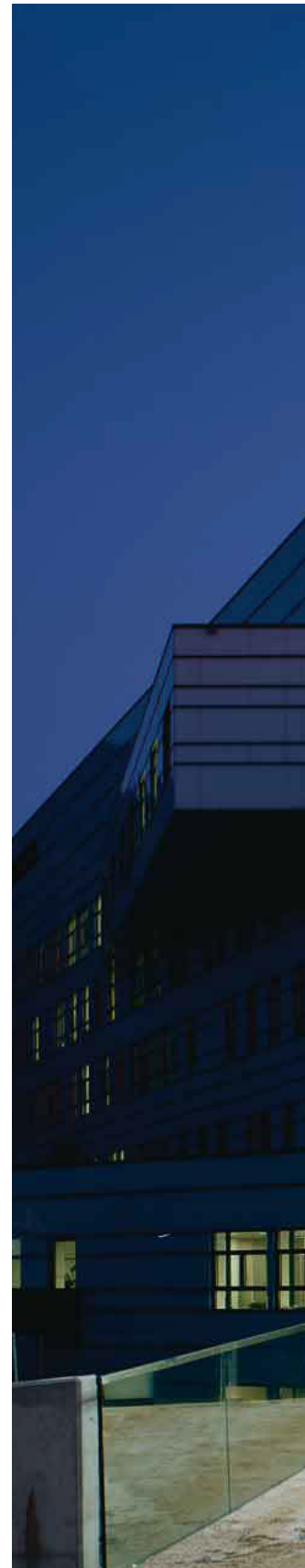
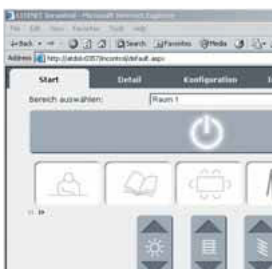
Lighting has a big impact on the total energy balance. Saving energy starts with using modern luminaire technologies. Modern light sources and luminaires reduce energy consumption while delivering significantly improved lighting quality. Dimming unnecessary light to minimum levels is especially efficient. Presence detectors and daylight-based control make this objective much easier to achieve. Lighting scenes that are precisely adjusted to cater for visitors' and patients' needs help use energy in a targeted manner.

Innovative LED solutions are especially recommended in clinics and care facilities. They are many times more efficient and longer lasting than standard lighting. It is possible, for instance, to install high-quality LED ambient lighting that pays for itself relatively quickly, thanks to lower operating costs.

Product recommendations

LUXMATE LITENET | Lighting management

LUXMATE daylight measuring head |
Sensor



Bregenz Regional Hospital | AT

Architecture: Baumschlager Eberle, Lochau, AT

Lighting solution: PURELINE lighting and supply units,
PANOS downlights, MELLOW LIGHT IV recessed luminaires

3 Ecological and economical

Improving cost-effectiveness

- **Economically efficient solutions start with efficient light sources and modern, dimmable ballasts**
- **Easy-to-install and durable LED luminaires cut operating costs**
- **Modern optics, lenses and reflector technologies ensure maximum energy efficiency with equivalent or even better lighting quality**

Slashing energy consumption in efforts to counter rising electricity prices is the order of the day. The cornerstone of this strategy is selecting the optimal light source combined with an efficient ballast. LED technology is already mature enough to allow LED luminaires to be used as replacements for conventional luminaires in many applications. Combining LEDs with dimmable, electronic ballasts optimises efficiency. Premium LED luminaires have the advantage of requiring hardly any maintenance. Moreover, their long service life and constant luminous flux means less frequent replacement. Intelligent systems with optimised optics, high-grade lenses and the latest reflector technology direct light perfectly so that it can fulfil its task in a targeted manner without any losses.

Investments in modern LED technologies have short payback periods, which even makes it worthwhile to refurbish existing lighting systems. Combining these luminaires with a lighting control system results in maximum energy efficiency.

Product recommendations

PANOS INFINITY | Downlight



LUXMATE ED-SENS | Presence detector



Baar Central Hospital | CH

Architecture: Burckhardt + Partner AG, Zurich | CH

Lighting solution: PANOS Q downlights, CLEAN cleanroom luminaires, TECTON continuous row luminaires





3 Ecological and economical

Image enhancement



- **Good light makes a great impression**
- **Light defines corporate identity**
- **Light shows architecture to full effect**

Architecture acts as a building's ambassador. The impression made on patients and visitors is shaped by what they see and view and by their first impressions of a facility's premises. Coherent, carefully selected interior decoration helps a hospital or care facility convey the values it wants to get across. Architecture-oriented light and modern luminaires enhance a building and enhance a facility's image. The fact that lighting solutions are not merely functional and in conformity with standards creates a positive impression. Light that blends into the architecture matter-of-factly, yet nevertheless stands out from it, makes all the difference.

Coloured light is used to convey a sense of character or to accentuate a facility's image. Colour changing light can emphasise the distinct appearance of a hospital or care facility, for instance. This creates a sense of identity and symbolises a feeling of belonging – to a town, to a business or an organisation.

Product recommendations

PERLUCE | Surface-mounted luminaire

CIELOS Move | Media luminaire



Herne Dialysis Centre | DE

Architecture: Ludes Architekten und Ingenieure, Recklinghausen | DE
 Lighting solution: ACTIVE LIGHT WALL luminous ceiling,
 MELLOW LIGHT IV recessed luminaires, PANOS downlights, LEDOS B
 recessed floor luminaires, PHAOS wall-mounted luminaires,
 SLOTLIGHT light lines, LUXMATE PROFESSIONAL, LUXMATE
 EMOTION lighting management systems

3 Ecological and economical

Taking a holistic view

- **Different application areas impose different requirements**
- **With intelligent building services management, general, emergency and safety lighting form a single unit**
- **Light as a feel-good factor is becoming more and more important**

A wide variety of application areas are encountered in hospitals and care homes. This results in complex lighting projects. Things start with the exterior lighting in the surrounding green spaces, the entrance and the helipad. Lighting concepts then extend into horizontal and vertical manoeuvring areas, administrative areas, examination and treatment rooms, laundry and kitchen areas, which sometimes have an industrial look, and other spaces. A lighting solution ultimately extends into patients' rooms and care rooms, as well as functional and operating areas.

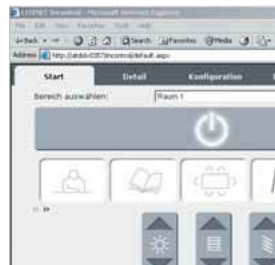
A central building services management capability is recommended for handling the different usage times and requirement profiles of various premises. Besides retrieving special situation-related lighting scenes, it is also possible to monitor the system in respect of maintenance cycles and repair work. Faulty lamps, system incidents and emergency and safety lighting tests are performed centrally and recorded in logs. These systems can be used effectively to integrate daylight, presence detectors or constant luminance technology, especially nowadays, given the exemplary role played by "green" buildings.

Light as an emotionally expressive design component is becoming increasingly important and can be contrasted with the strictly functional and technical aspects of lighting. Patients and residents expect to feel at ease in hospitals and care homes and, just like staff, would rather spend time in pleasant surroundings.

Product recommendations

[SCUBA LED | Diffuser luminaire](#)

[LUXMATE LITENET | Lighting management](#)



Campus Biomedico di Roma | IT

Architecture: Studio Architetti Associati, Pesch. Borromeo | IT
Lighting solution: COPA high-bay luminaires, PANOS downlights,
MELLOW LIGHT IV recessed luminaires, CONBOARD lighting and
supply units (special design)



Lighting management

Lighting control for hospitals and care settings

Hospitals and care facilities make huge demands on lighting. Lighting control makes lighting more sensitive to patients' needs. It makes various lighting scenarios available for rapidly-changing work situations and automatically adjusts lighting conditions to suit different times of day. This is becoming more and more important in care settings because patients' requirements in examination rooms differ drastically from those of staff in office premises, corridors and passageways. Zumtobel has the right solution for every situation.

Patients' and care rooms



Offices and administration



Convenient operation

It must be extremely convenient for patients and staff to select a lighting scene, regardless whether they use a momentary-action switch or a remote control to do so. Simple controls make allowance for patients who have restricted abilities. Convenience for building services staff means unrestricted access to the entire system at all times. Lighting scenes can be modified and safety lighting can be inspected at any time.

Dynamic daylight transitions

Lighting that mimics daylight in terms of light colour and intensity makes people feel safer and more at ease. Areas where there is little daylight derive particular benefit from such lighting. When used in combination with variable colour-temperature, dimmable luminaires, LUXMATE lighting control systems create perfect lighting conditions for various types of rooms.

Energy saving

Intelligent automation provides a variety of ways of saving energy: a built-in calendar with adjustable time slots can switch artificial lighting on and off at pre-set times. Combined with presence detectors, this boosts the efficiency of a lighting solution even more. Using a daylight-based LUXMATE lighting control system has the highest energy savings potential: depending on outdoor light conditions, blinds are automatically used for glare control, overheating of buildings is prevented and artificial lighting is automatically dimmed down to defined lighting levels.

Safety

Safety is paramount. This is why Zumtobel offers a unique way of combining general lighting management systems with an emergency lighting system. For instance, LITENET is used to monitor emergency and escape sign luminaires that are powered by an ONLITE central battery system. Building services staff are immediately alerted if a lamp fails or a malfunction occurs.

Foyers and lounges



Treatment and operating areas



Underground car parks and plant rooms



Emergency lighting

Inconspicuous in day-to-day life – reliable in an emergency

Inspiringly diverse

High-end design runs through Zumtobel's versatile ONLITE luminaire product portfolio like a common thread. The luminaires can be powered, controlled and monitored centrally or locally. Easy installation and commissioning keep both investment and operating costs low.

Patients and staff



Economically efficient complete solution

Elisabeth Residential Care Facility, Breda | NL

Architecture: BDG architecten ingenieurs, Almere | NL
Lighting solution: CIELOS luminous ceiling, PERLUCE O diffuser luminaires, PANOS downlights, MELLOW LIGHT IV recessed luminaires, FEC recessed luminaires, ONLITE escape sign luminaires/emergency luminaires, COPA high-bay luminaires, PASO II RGB recessed floor luminaires, VAERO pendant luminaires

ONLITE emergency lighting combines good looks with excellent functionality. CE and ENEC-certified luminaires delivering guaranteed luminance of 500 cd/m² guide people out of buildings safely in the event of an emergency, even though the escape sign and emergency luminaires blend harmoniously into the architecture in everyday life. This provides a prestigious lighting solution which meets both today's patients' and employees' requirements in terms of safety and aesthetic styling.



ONLITE ARTSIGN

The smallest escape sign luminaire in the ONLITE range offers maximum reliability and efficiency. Powerful Power LEDs which are absolutely maintenance-free and boast a long service life ensure a recognition range of 15 m.

Design by Matteo Thun



ONLITE COMSIGN

The elegant escape sign luminaire is characterised by transparent acrylic glass and anodised aluminium. Its functional capabilities are made possible by its innovative LED technology and a recognition range of 26 m.

Design by Matteo Thun



ONLITE PURESIGN

A 3 mm frame made of special aluminium, a low mounting height and a recognition range of 30 m – these are the external dimensions of the slim-line PURESIGN. Inside the escape sign luminaire, state-of-the-art LED and lighting technology is used.

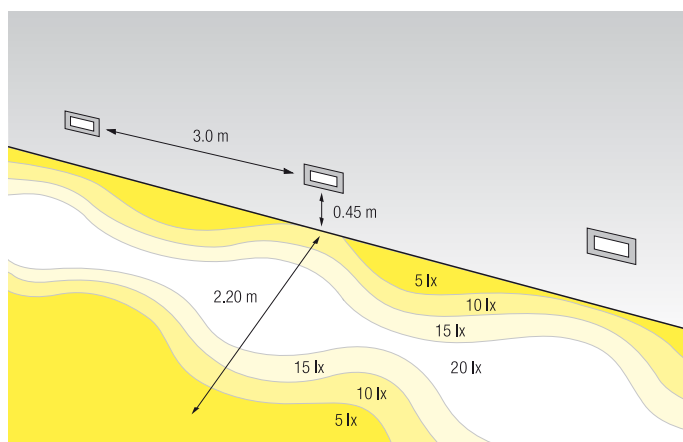
Design by EOOS



ORILED

LED orientation luminaire

ORILED is available as a bollard, wall-recessed or surface-mounted wall luminaire with separate batteries for 1 or 3 hours of operation to ensure safe lighting at ground level.



The LED orientation luminaires effortlessly and elegantly meet the requirements of EN 1838 for escape-room lighting.

Thanks to easy installation and commissioning and modern LED technology, these escape sign and emergency luminaires will solidly underpin any attempt to keep the costs of an emergency lighting installation as low as possible throughout the product's entire life cycle. They have a service life of 50,000 hours,

require little maintenance and use power frugally. If the luminaires are monitored by a central control system, the installation is automatically and freely configurably tested, faults are detected and recorded in a built-in test log book.



ONLITE central CPS

Emergency lighting systems with central power supply

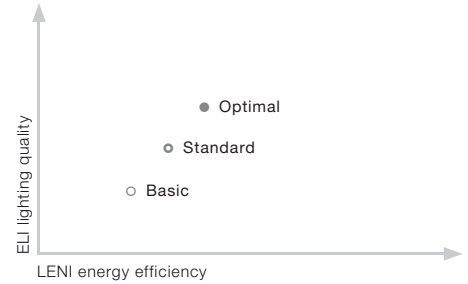
Building on a modular system, Zumtobel adapts every central-battery system to meet customers' exact project-specific needs. Each DALI luminaire can be used in a central-battery system as a separately monitored and individually controlled emergency luminaire. Other advantages of DALI-based communication: minimal maintenance effort, fault-tolerant data communication and no need for additional communication components in luminaires.

Lighting solutions

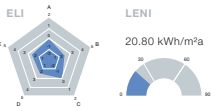
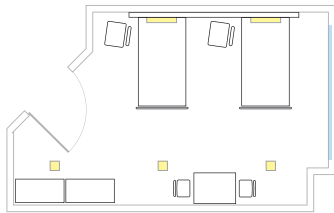
Human Aspects + Energy Efficiency = Humanergy Balance

Patients' rooms

Here, the challenge is to strike the right balance between patients' needs and the requirements of doctors and care staff. High lighting levels are only rarely required for examinations. Enabling individualised usage and adjustment of lighting, and integrating daylight achieves the best possible lighting quality and energy efficiency.



Basic



- VE-L/V medical supply system
- PANOS Q downlights
- DIMLITE lighting management system

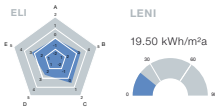
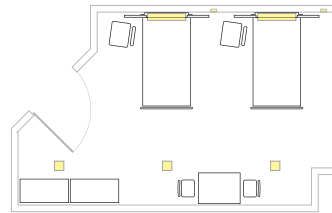
Lighting quality

– Appropriate lighting scenes for reading, visiting hours and examinations

Energy efficiency

– Using lighting components on an as-needed basis only reduces energy consumption

Standard



- CONBOARD NP medical supply system
- CUREA bedside luminaires
- KAVA wall-recessed luminaires
- PANOS Q downlights
- ZBOX lighting management system

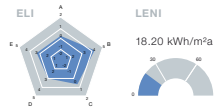
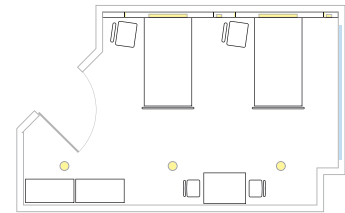
Lighting quality

– Pleasant room atmosphere thanks to concealed medical equipment
 – Waveguide technology delivers perfectly glare-free room and reading light
 – Lighting components for every activity
 – Additional orientation light for night-time safety

Energy efficiency

– Roughly equivalent energy consumption with significantly improved lighting quality
 – ZBOX with automatic night economy mode saves additional energy

Optimal



- IMWS medical supply system (with built-in room and reading light)
- RESCLITE wall-recessed luminaires
- PANOS INFINITY WW downlights
- LITENET lighting management system

Lighting quality

– Integrated wall-mounted system with medical supply, electric feed and lighting
 – Integration of natural daylight
 – Additional vertical wall brightening for balanced luminance levels

Energy efficiency

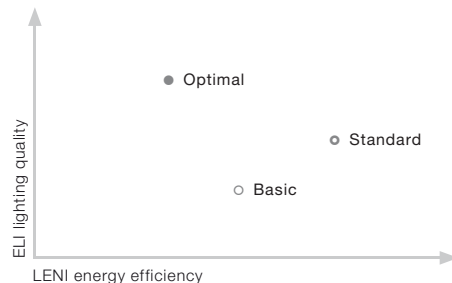
– A lighting control system that extends throughout an entire building exploits potential energy savings to the full

Underlying conditions:

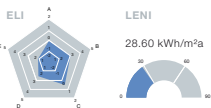
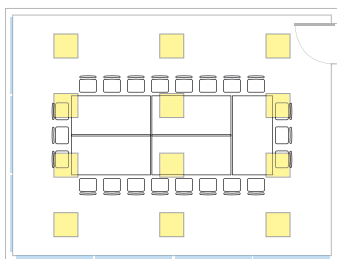
Patient's room
 4 m x 8 m, 8 hours, 365 days/year

Common areas

In care settings, the focus of attention is on the individual, lighting design also focuses on the individual. Higher lighting levels, variable colour temperatures and timely changes from diffuse to directional light distribution help stabilise natural sleep-wake rhythms. This requires additional expenditure on energy but delivers enormous added value in terms of lighting quality.



Basic



- MELLOW LIGHT V 1/55 W TC-L recessed luminaires
- Switched

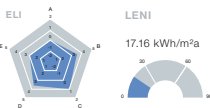
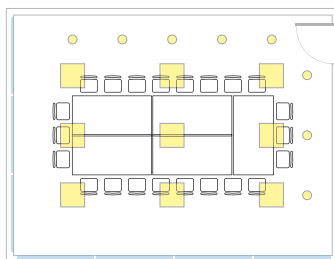
Lighting quality

– Homogeneous general lighting with soft light distribution also brightens up walls and ceilings

Energy efficiency

- Latest-generation luminaires offer maximum efficiency
- Durable, maintenance-free LED models for improved luminaire efficiency but lower installed load

Standard



- LIGHT FIELDS LED 1/44 W recessed luminaires
- PANOS INFINITY WW Stable White downlights
- LUXMATE DIMLITE lighting management system

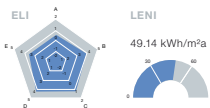
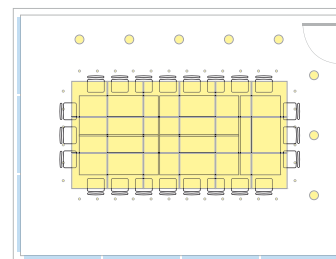
Lighting quality

- Uniformly, homogeneously illuminated communication areas enable visual tasks to be performed even by individuals with impaired vision
- Well-balanced luminance distribution: vertical surfaces brightened up by wallwashers

Energy efficiency

- Extremely efficient LED area lighting meets all glare limitation requirements
- Lighting scenes can easily be adjusted to suit specific activities and times of day

Optimal



- CIELOS 3C 12/21 W luminous ceiling
- PANOS INFINITY WW Tunable White downlights
- SUPERSYSTEM 1/2.5 W lighting channel system
- LUXMATE EMOTION lighting management system

Lighting quality

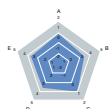
- Variable colour-temperature luminous ceiling for high, uniform luminance levels
- Dynamic changes in colour temperature compensate for lack of daylight
- Small spotlights for directional light, shadow details and enhanced contrast provide variety
- Vertical wall lighting for balanced luminance levels that provide a counterpoint to daylight

Energy efficiency

- Timer-controlled lighting reduces actual energy consumption

Underlying conditions:

Common areas
8 m x 6 m, 8 hours, 365 days/year



ELI Ergonomic Lighting Indicator
Lighting quality assessed on the basis of five criteria:
A Visual performance
B Vista
C Visual comfort
D Vitality
E Empowerment



LENI Lighting Energy Numeric Indicator
Energy consumption in kWh per annum and per square metre, based on EN 15193

Global partnerships

Closely meshed network



What are the distinguishing features of a “green” hospital?

What must it be able to do and how is it different to present-day clinics? What contribution can it make towards a sustainable healthcare system?

These are the issues that “Green Hospital”, an international alliance of clinics, doctors, experts and companies set up by Asklepios Clinics, is getting to grips with. They are committed to sustainable preventive medical care and responsible use of energy resources in line with ecological principles. An awareness that humans are just a small part of the ecosystem they live in and that their well-being is heavily dependent on the state of this ecosystem is synonymous with a new mind-set that is supported and promoted by a broad, political, ecological and socio-cultural consensus.

Green Hospital aims to use innovative efficiency and quality models to flag up relevant solution scenarios for clinics and healthcare facilities. These are intended to help achieve the following objectives in the case of new buildings, conversions and refurbishment and modernisation projects:

- Significant reduction in environmental impact by using natural resources in an ecologically and economically responsible manner
- Protect and promote health and well-being of individuals as part of preventive medical care
- Ecologically responsible, sustainable construction practices based on energy-efficient technologies and the use of materials that are environmentally compatible and not detrimental to health

Light plays a crucial role in many areas of the Green Hospital Programme. Used correctly, it makes a vital contribution towards improving health and well-being. Lighting is therefore viewed not merely as a technology-driven product, but as an element that is just as important to human health as fresh air and clean water.

Many Green Hospital research projects concentrate on finding an ideal balance between energy-efficient technology and good lighting quality. Lighting accounts for roughly a quarter of clinics’ electricity bills on average. Many of them are still using obsolete lighting systems. Integrated supply systems with innovative lighting solutions that include intelligent controls provide plenty of scope for energy savings. LED technology can also make a significant contribution.

As part of this Programme, Zumtobel is devising innovative lighting solutions for all healthcare work and lounge areas.

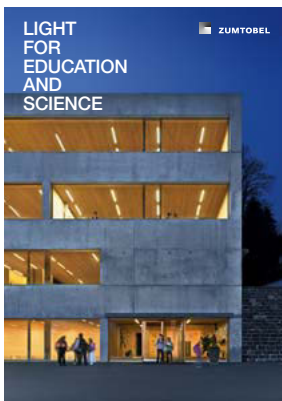
“The Green Hospital initiative launched by Asklepios Clinics and its partners aspires to be a “pioneer and trailblazer” on the road towards ecologically-focussed sustainability in future healthcare. The Programme’s main emphasis is on protecting the environment and patients. As healthcare facilities and service centres for patients and employees, clinics, more than any other healthcare facility, are perfectly positioned to shoulder this responsibility.”



Lothar Dörr
Green Hospital Program Director



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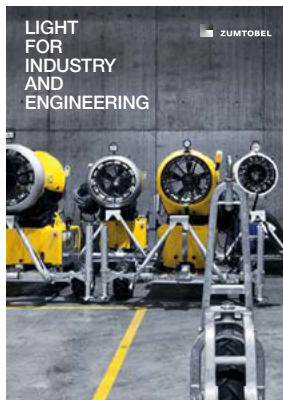
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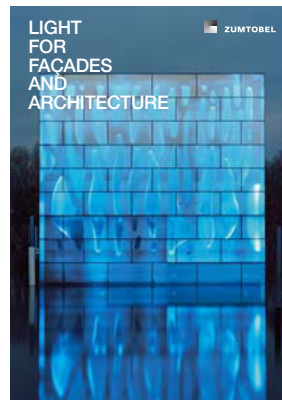
zumtobel.com/culture



zumtobel.com/healthcare



zumtobel.com/industry



zumtobel.com/facade

Zumtobel is the internationally leading supplier of integral lighting solutions for professional interior and exterior lighting applications.

- Offices and Communication
- Education and Science
- Presentation and Retail
- Hotel and Wellness
- Art and Culture
- Health and Care
- Industry and Engineering
- Façades and Architecture

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

Lighting and sustainability

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

zumtobel.com/sustainability



Top quality – with a five-year guarantee.
As a globally leading luminaire manufacturer, Zumtobel provides a five-year guarantee for its complete product range with effect from 1 April 2010.

zumtobel.com/guarantee

Order no. 04247 629-EN 10/11 © Zumtobel Lighting GmbH
Technical data was correct at time of going to press.
We reserve the right to make technical changes without notice. Please contact your local sales office for further information. For the sake of the environment: Luxo Light is chlorine-free paper from sustainably managed forests and certified sources.





Track and spots



Modular lighting systems



Downlights



Recessed luminaires



Surface-mounted and pendant luminaires



Free-standing and wall luminaires



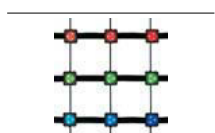
Continuous-row system and individual batten luminaires



High-bay luminaires and floodlight reflector systems



Luminaires with extra protection



Facade, media and outdoor luminaires



Lighting management system



Emergency lighting



Medical supply systems

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LIGHT FOR HEALTH AND CARE

