



Light for care

Focusing on the individual
and his or her needs.



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



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Motivation

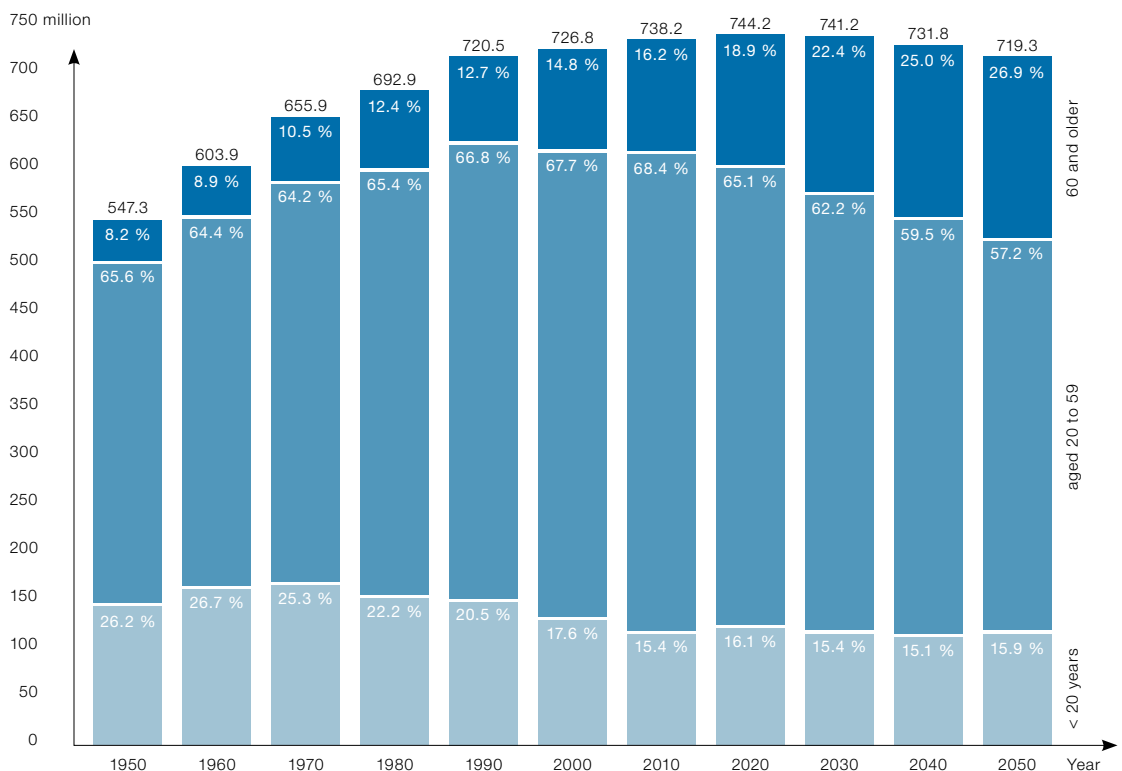
Keeping up with changes

Society is undergoing rapid demographic change. The number of elderly people is set to rise inexorably. This means that in future there will be more and more people who require care. Long-term care is therefore facing new challenges in terms of both quantity and quality. The challenge is to cater for the special needs of all care home residents. Illnesses such as dementia and Alzheimer's, restricted mobility and impaired vision are among the factors that make demands on care personnel.

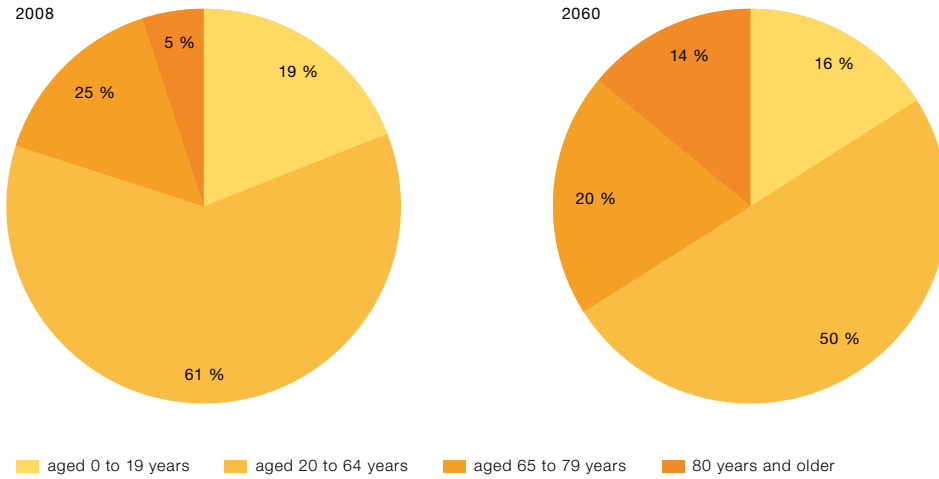
The right lighting for greater quality of life

Eyesight usually deteriorates markedly in old age. Consequences include reduced perception of depth and colour and poorer eye accommodation. A professional lighting solution that can be adapted to suit such circumstances can significantly improve quality of life in care facilities. It takes into account the fact that older people generally require more light and their increasing sensitivity to glare. In addition, a forward-looking lighting concept compensates for inadequate amounts of daylight. This helps stabilise the human circadian rhythm, set the "body clock" correctly and foster a general sense of well-being.

Population growth in Europe

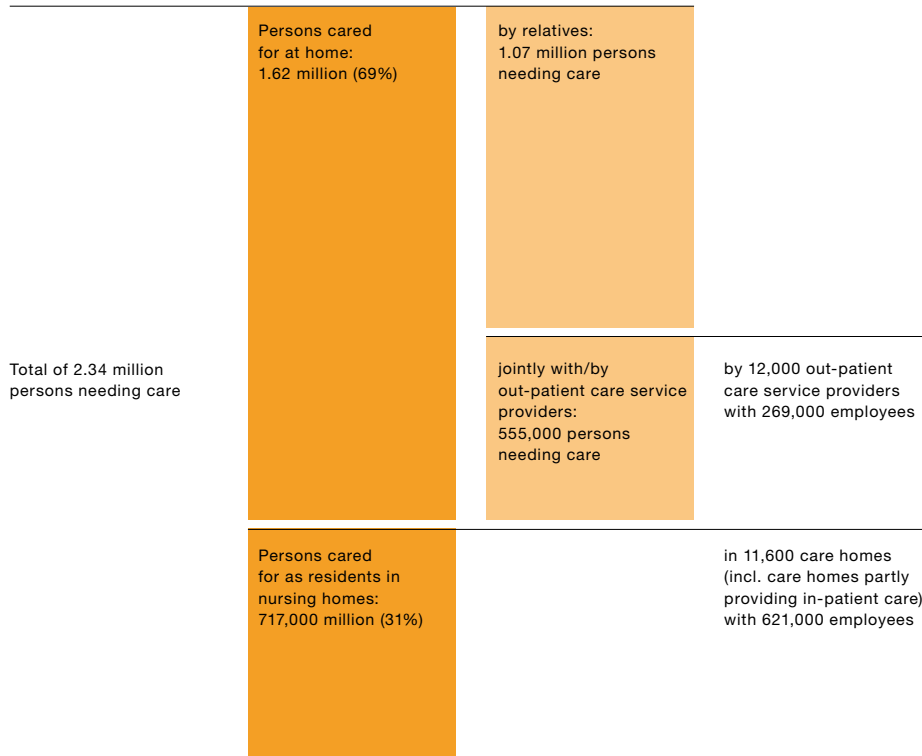


Population by age group (Germany)



Source: Demographic development in Germany until 2060, 12th coordinated population forecast. Federal Statistical Office 2009

Persons requiring care, by type of care (Germany)



Source: 2009 care statistics, care provided under care insurance, data for Germany. Federal Statistical Office 2011

Requirements

Vision and feelings

Eyesight begins to gradually deteriorate from the age of around 40. Most people need reading glasses to read fluently from this age onwards.

The lens of the eye gradually becomes less transparent and most people realise, for the first time, that they need more light in order to see properly. Older people need more light. For a given visual task, they require almost four times as much light as younger people do. These facts have an impact on responsible lighting design for care homes, especially in corridors and meeting areas.

Old age brings new challenges

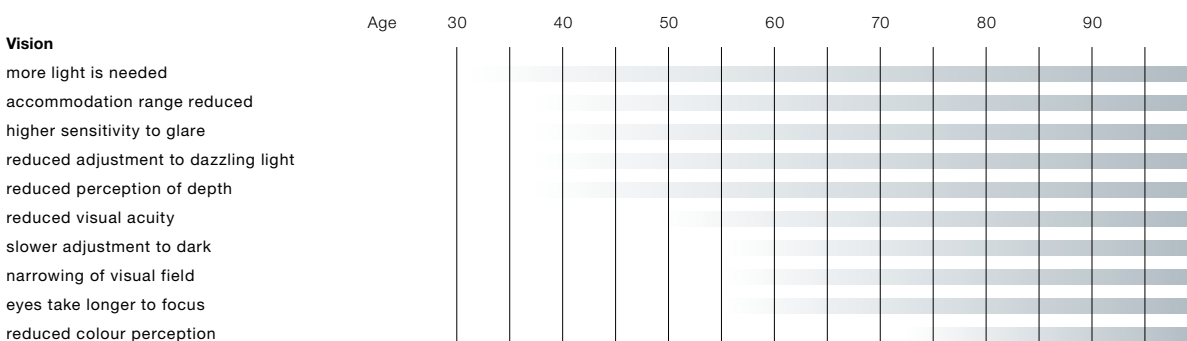
Drastic deterioration in visual performance is often accompanied by an eye disease. When the lens of the eye becomes opaque, this results in a cataract. This significant deterioration in acuteness of vision not only makes reading more difficult, it also makes it hard to find one's way around. Because of the reduced refractive power of the lens of the eye, judging distances becomes more difficult. It is no longer possible to estimate spatial dimensions and distances correctly. Excessively strong shadows, contrast, reflections or glare can easily cause visual misinterpretation. This is why the elderly no longer feel so safe when they move around. Another problem of old age: subtle differences in contrast are no longer perceived adequately, faces and people become harder to recognise. Because of their decreased cognitive ability, this is a major challenge in the case of dementia patients in particular. Such a situation easily leads to great insecurity and anxiety.

Light, not just for seeing

Light has a biological effect on people. It sets the body's circadian rhythm, our internal body clock. This timer function has a huge effect on well-being and human health. When this rhythm runs smoothly, we can be active and productive during the day and sleep restfully at night. In the case of the elderly, this rhythm can often become disrupted if they do not get sufficient daylight. Due to restricted mobility and the lack of day-to-day routine, the body can find it difficult to differentiate clearly between waking and resting hours. Possible consequences include depression in older people, feelings of anxiety and general uneasiness. Dementia patients are particularly susceptible to such disturbances because they have a negative impact on their already restricted orientation and perception abilities.

Well thought-out lighting design specially geared towards the needs of the elderly must therefore be a top priority in care homes. Zumtobel has conducted its own investigations and studies on lighting in nursing homes for the elderly in order to be able to provide specific design tips in this area and supply appropriate products.

Changes of sensory abilities at adult age (extract)



Source: Age and environment. An introduction to environmental gerontology. Saup 1993

- 1 Simulation of common age-related eye disease (macular degeneration)
 - 2 Corridor as seen by someone with healthy eyes
 - 3 Simulated age-related impairment of vision (vision reduced by 90%)
- You will find simulation glasses on the back cover of this brochure**



Study results

St. Katharina residential care home, Vienna

Light provides important timing cues for our body. The circadian system physically and psychologically controls our sleep-wake rhythm over the course of a day. The production of important metabolites drops off as we age: melatonin and serotonin are responsible for keeping our inner clock ticking over. This poses the question of whether it is possible to use light to stabilise the circadian rhythms of persons who need care, thereby improving their quality of life.

Question

Does a higher, dynamically controlled light input result in enhanced well-being and increased social activities in older people? In cooperation with the Lighting Competence Centre and other partners, Zumtobel conducted a trial intended to examine precisely this question in the dementia care ward of the St. Katharina residential care home in Vienna over a period of 15 months.

More light in the daytime

Extensive refurbishment of the St. Katharina residential care home in Vienna provided the opportunity to install a professional, custom lighting installation for the newly built dementia care ward. An effort was made to design lighting that was as similar as possible to daylight in order to ensure the benefits of the biological effect of light in interiors and investigate its effect on residents. To achieve this, a special luminous ceiling was installed in the dementia care ward; besides conventional fluorescent lamps (3000 and 6500 K), this also used "skywhite" lamps (8000 K). Large 900 x 900 cm CIELOS were used as luminaires. Every wide-area luminaire was fitted with 12 lamps (4 of each light colour). This paved the way for dynamically controlling colour temperature and illuminance over a very wide range.

Study design

As part of the study, a standard situation and its impact was compared to lighting situations where lighting intensities and colour temperatures varied or mimicked dynamic daylight transitions. The behaviour of residents was observed and analysed over an extended period of time. Particular interest was paid to communication and interaction between residents and with nursing staff.

Data was collected for a total of 15 residents who had an average age of 88 years over the observation period. They were primarily women who had received vocational training. All the residents suffered from some form of dementia (Alzheimer's disease, vascular dementia, dementia as a set of secondary symptoms) that made it impossible for them to continue living independently.

Four lighting scenarios and their light colour and luminance limit values

Lighting scenario	Light colour	Illuminance	Control system
Baseline BL	3000 K	300 lx	Static
L1	3000 K	Approx. 2000 lx	Static
L2	8000 K	Approx. 2000 lx	Static
L3	3000 to 8000 K 300 lx / 3000 K 2200 lx / 8000 K	From 300 to 2000 lux Morning/evening Midday	Dynamic

Measurement methods

Behaviour and vitality	Neutral observers collected sensory data regarding mobility in recreation areas.
Cognitive orientation and emotional well-being	Neutral observers, test data and nursing staff provided information on changes
Medication	Decisions were based on information from nursing staff and analysis of care files
Nursing staff	Information was obtained through questionnaires, structured interviews and on the basis of self-assessment scales

St. Katharina Residential Care Home, Vienna | AT

Architecture: Peretti + Peretti, Vienna | AT

Lighting solution: CIELOS luminous ceiling, VIVO spotlights, 2LIGHT MINI downlights, LUXMATE PROFESSIONAL lighting management system



Findings

The trial was very revealing and produced positive results in the case of dynamic lighting:

- Residents became more active
- Residents spent more time in day rooms
- Communication with care staff intensified
- Sleeping patterns improved
- Working conditions for care staff became more pleasant

The luminous ceiling in the St. Katharina residential care home was able to compensate for a lack of daylight. Dynamic lighting scenarios in which colour temperature and lighting intensity were varied over the course of the day produced especially good results. During the day, high luminance levels up to 1500 lx and cooler colour temperatures proved to be particularly effective. Low luminance levels of no more than 300 lx and warm light colours gave impressive results in the morning and in the evening.

Residents became demonstrably more active, communicative and contented. They basically showed greater interest in their surroundings. Overall, greater willingness to participate in day-to-day events was noticed. Care staff also reacted positively. Satisfaction levels rose and working conditions were felt to be more pleasant. The residents' better sleeping patterns had a double effect: sleep was more restful, and this eased the care staff's workload at night time.

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, LUXMATE PROFESSIONAL lighting management system



Excerpts from various guidelines

Standard EN 12464 does not make sufficient allowance for the marked deterioration in visual function that affects the elderly, or their resulting needs. For instance, this standard contains very precise specifications for lighting in office buildings and applicable requirements but more exacting requirements due to the elderly's poor vision occupy a subordinate role.

VDI Guideline 6008¹ on lighting in hospitals, nursing homes and intergenerational dwellings and the Guide² to daylight-oriented interior lighting of homes for the elderly deal with particular requirements that are applicable to the elderly.

Both recommendations attach great importance to establishing a connection to daylight so that the elderly have sufficient opportunity to get enough daylight. In addition, they recommend not only higher illuminance levels in general but also daytime and night-time lighting scenarios that are sensibly in harmony with human circadian rhythms.

	EN 12464	Zumtobel's recommendations
Reception/entrance	– 300 lx	– 300 lx
Corridor areas	– In the daytime 200 lx – At night-time 50 lx	– During the day: at least 60% of the illuminance level prevailing in the lounge area – At night: 50 lx, adjustable up to 100 lx
Communal space, recreation room	– 200 lx	– In the morning: 300 to 500 lx with a colour temperature from 4500 to 6500 K – In the day time: up to 1500 lx throughout the day with a colour temperature from 4500 to 6500 K – In the evening: 300 to 500 lx with a colour temperature from 2700 to 3500 K
Resident's room and bathroom	– 100 lx for bedrooms – 200 lx for bathrooms	– Residents' rooms: at least 300 lx, colour temperature from 2700 to 3500 K. Additional reading light with luminance of 1000 lx in reading area and/or additional bedside reading and examination light. Night-time orientation light. – Bathroom: 300 lx, 2700 to 3500 K; separate mirror lighting
Administrative and task areas	– 500 lx for offices	– 500 lx with variable lighting situations, especially for night-time working – Another recommendation: adequate transitional zones between brighter and darker areas and between outdoor and indoor areas give older eyes sufficient time to adapt to different lighting conditions.

¹) VDI Guideline 6008 - Lighting in hospitals, nursing homes and intergenerational dwellings

²) Guide to daylight-oriented interior lighting of homes for the elderly

Lighting for communal spaces

Being together and being active

The day room is the heart of any care facility. It is the central point for meeting, communicating, being active and lounging. Value can be added to the time that residents spend here. They discuss, read, write, watch TV, do needlework or eat, communally. The large number of activities performed here and their disparate nature make heavy demands on lighting. Functional and visual requirements must be met equally effectively and the need for a cosy, homely feel must also be met.

Light has the ability to stimulate elderly residents and invigorate them throughout the day. Lighting concepts with variable colour temperatures are the ideal way of achieving this. Light colours are deliberately varied from a warm 2700 K to a cool 6500 K for this purpose. Appropriately adjusted illuminance levels support and strengthen circadian rhythms. When used correctly, light provides residents with cues indicating the time of day, thus helping them stay active in the day and then get a healthy, refreshing night's sleep.

Wide-area, diffuse luminous panels act like pools of light thanks to their high lighting intensity. They stimulate photoreceptors in the lower part of the retina over a wide area. Additional directional light accentuates and provides the kind of shadow detail that makes spatial perception easier. Vertical illuminance levels and pleasant luminance levels add the perfect finishing touch to a stimulating lighting concept.

Recommendations

- High lighting levels when needed
- Bright, diffuse luminous panels with visible luminance levels but no glare
- Provide ways of varying the lighting scene and retrieving lighting scenarios
- In the morning: 300 to 500 lx with a colour temperature between 4500 and 6500 K
- During the day: provide up to 1500 lx throughout the day with a colour temperature between 4500 to 6500 K
- In the evening: use 300 to 500 lx with a colour temperature from 2700 to 3500 K (e.g. wallwashers with warm white light colour as a prompt to announce bedtime)
- Ensure easy operation for staff
- Use dimmable luminaires to save energy

Lighting solutions that improve the quality of life of the elderly consume more energy. These additional energy and investment costs will pay off because of improved lighting quality and reduced stress for care personnel.

St. Franziskus Care Home, Marsberg | DE

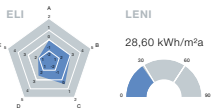
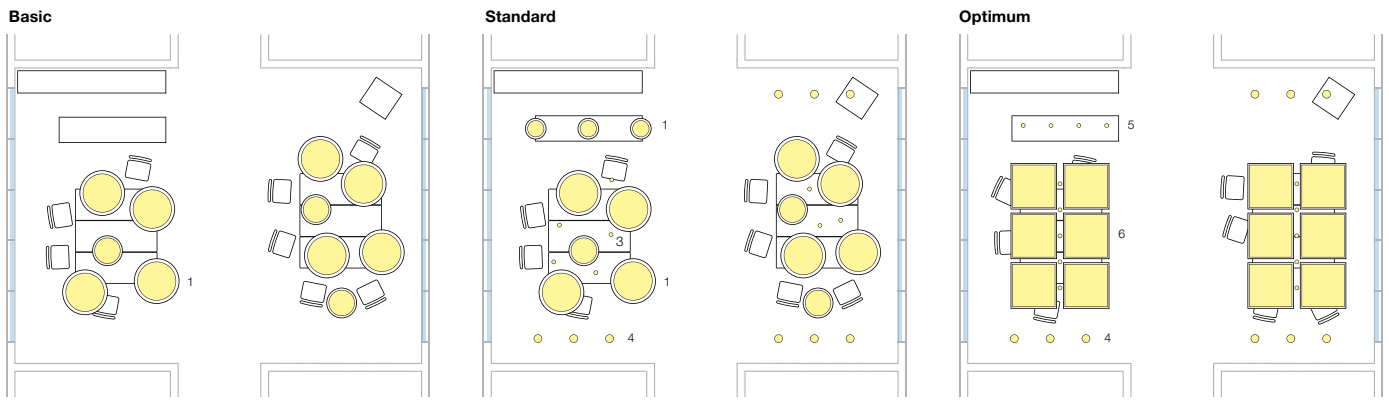
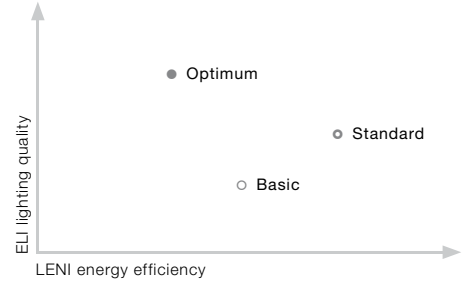
Architecture: F. Bereuter AG, Rorschach | CH

Lighting solution: special design

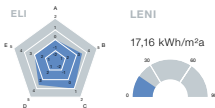


Balanced lighting solutions for communal spaces

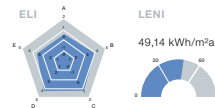
In care settings, the focus of attention is on the individual; lighting design also focuses on the individual. Higher lighting levels, variable colour temperatures and changes from diffuse to directional light distribution help stabilise natural sleep-wake rhythms. The higher energy consumption this involves is easily justified by the improved lighting quality obtained and associated feel-good factors.



- ONDARIA⁽¹⁾ circular luminaire 640/940, 4000 K
- Lighting management CIRCLE (2) control point



- ONDARIA⁽¹⁾ circular luminaire 440/640/940, 4000 K
- SUPERSYSTEM⁽³⁾ 1/2.5 W spots, 3000 K
- PANOS INFINITY⁽⁴⁾ WW Tunable White downlight
- LUXMATE EMOTION⁽⁵⁾ lighting management system



- CIELOS⁽⁶⁾ 3C 12/21 W luminous ceiling
- SUPERSYSTEM⁽¹⁾ 1/2.5 W spots
- PANOS INFINITY⁽⁴⁾ WW Tunable White downlight
- LUXMATE EMOTION⁽⁵⁾ lighting management system

Lighting quality

– Uniform general lighting with gentle light distribution that also brightens up walls and ceilings

Energy efficiency

– Pools of light concentrate energy requirements in locations where light is actually used

Lighting quality

– Uniformly illuminated day rooms enable visual tasks to be performed even by individuals with impaired vision

– Vertical surfaces brightened up with different colour temperatures have a biological effect

– Spotlights meet the need for directional light

Energy efficiency

– Simple adjustment of lighting scenes to suit particular activities and times of day automatically produces energy savings

Lighting quality

– A variable colour-temperature luminous ceiling models high, uniform luminance levels

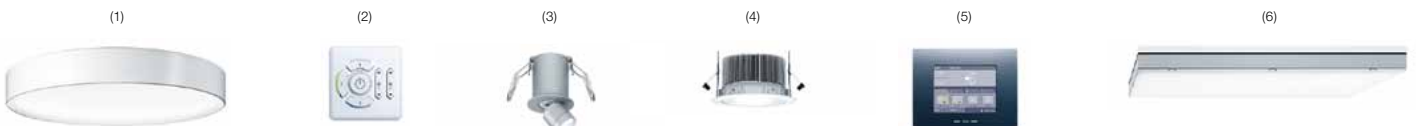
– Dynamic changes in colour temperature compensate for lack of daylight

– Providing directional light, small spotlights improve shadow detail and contrast, thus ensuring variety

– Vertically illuminated walls provide balanced luminance levels that act as a counterpoint to daylight

Energy efficiency

– Time-based control reduces energy consumption significantly



Underlying conditions: day room, 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 Annual energy consumption in kWh per square metre, based on EN 15193

Light for corridors and circulation areas

Safety, one step at a time

In corridor areas, lighting can make an important contribution towards making orientation easier and taking into account the elderly's need for greater safety. This is especially important in the case of dementia patients because disorientation can easily lead to a state of anxiety. Shadowing such as "passing shadows", reflections caused by light, or "blobs of light" on shiny materials can potentially lead to stumbling and pose a hazard to the elderly and must therefore be prevented. Care must also be taken to ensure a balanced ratio between cylindrical and horizontal illuminance in order to make facial recognition easier.

Corridors are usually directly adjacent to communal spaces. Higher lighting intensities and light colours that change throughout the day are called for here. Nevertheless, an effort must be made to ensure gradual transitions between different spaces. Light entices people into recreational and communal areas. The aim is to achieve a good balance between directional and diffuse light. Excessively diffuse light hampers spatial vision. Visible luminance levels on walls assist spatial vision. The optimum cylindrical/horizontal illuminance ratio is 0.3 to 0.6.

If stairs cannot be avoided, each step must be easily visible and must not cast any distracting shadows. A simple-to-operate lighting system makes it easier for staff to do their work and improves safety; it makes it possible to respond quickly in an emergency, even at night, and emergency lighting in particular makes allowance for the way that the elderly see things.

Recommendations

- High, uniform illuminance levels
- Balanced luminance levels on walls and ceilings
- Special lighting for potential danger spots and direction signs
- Avoid shadowing which can cause confusion and pose a trip hazard
- Balanced horizontal and vertical (cylindrical) illuminance levels improve the ability to recognise faces when meeting people in corridors, thereby preventing anxiousness
- Prevent any possibility of glare and reflections
- Use intelligent lighting management to obtain dimming
- At night-time, use presence-based control to reduce lighting levels without compromising on ensuring efficient orientation
- Use emergency lighting that is appropriate for the elderly to illuminate escape routes
- Provide clearly recognisable escape signs

Caritas Socialis, Vienna | AT

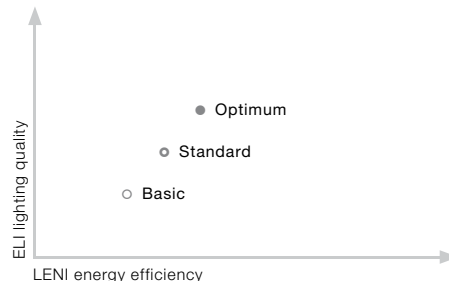
Before/after

Lighting solution: MELLOW LIGHT V recessed luminaires, COMSIGN escape sign luminaires, LUXMATE PROFESSIONAL lighting management system



Balanced lighting solutions for corridors

In healthcare facilities, corridors fulfil a communicative function by linking communal spaces and residents' rooms. Orientation must be made easier and optical illusions must be prevented here. Gradual transitions between lighting levels and light colours are associated with higher energy requirements. Energy requirements can be reduced considerably by using lighting intelligently.



<p>Basic</p> <p>1</p> <p>• SLOTLIGHT II ⁽¹⁾ light line, dimmed</p>	<p>Standard</p> <p>2</p> <p>• ONDARIA ⁽²⁾ circular luminaire 440 • LUXMATE EMOTION ⁽³⁾ lighting management system</p>	<p>Optimum</p> <p>4 5</p> <p>• PANOS INFINITY ⁽⁴⁾ Tunable White downlight • KAVA ⁽⁵⁾ recessed wall luminaire • LUXMATE EMOTION ⁽³⁾ lighting management system</p>
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Lighting quality

– Uniform lateral illumination provides clarity and makes it easier to get one's bearings

Energy efficiency

– Dimmable lighting makes a contribution towards reducing energy consumption

Lighting quality

– Uniform light distribution in corridors eliminates dark areas
– The shape and design of luminaires make the transition from a communal space to residents' rooms much more apparent

Energy efficiency

– The already good efficiency of lighting can be boosted further still by time-based dimming

Lighting quality

– Variable colour-temperature downlights in corridors repeat the colour temperature and intensity of lighting in communal spaces
– A recessed wall luminaire at eye level marks out the entrance to a resident's room and aids orientation

Energy efficiency

– The already good efficiency of LED lighting can be boosted further still by time-based dimming



Underlying conditions: corridor area, 2.5 m x 12 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 Annual energy consumption in kWh per square metre, based on EN 15193

Light for residents' rooms

A well-balanced lifestyle

A resident's room is ideally a space that affords privacy. Offering the option to withdraw from communal spaces involves using just the right amount of light in a targeted manner rather than having to forego lighting. Personal belongings or furniture can often be enhanced in order to preserve memories and individuality. Warm colour temperatures and tailor-made lighting scenarios can also provide a homely note. Various sources of light such as a ceiling-mounted luminaire, a desk lamp or a reading light can provide richly varied lighting scenes.

In the case of residents who suffer from dementia, free-standing luminaires can be dispensed with and replaced by wall or ceiling-mounted luminaires. Easy operation of lighting or automatic control to banish possible uncertainty is another generally important consideration. Less mobile residents need an additional flexibly adjustable bedside reading light and an examination light that delivers illuminance of at least 1000 lx at the push of a button.

It is necessary to make sure that residents can find their way round their room safely at night in order to use the toilet. In the bathroom it is important for the face to be brightly lit and to reduce harsh shadows. This can be accomplished by using a ceiling-mounted luminaire for general room lighting and additional vertically arranged mirror lighting.

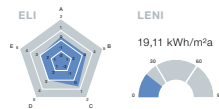
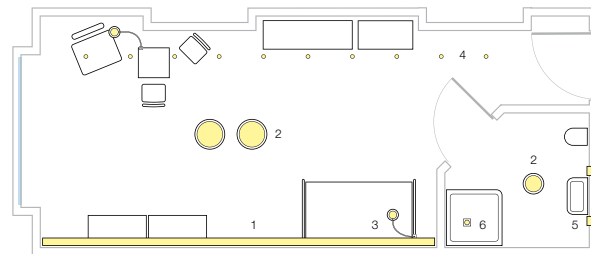
Recommendations

- Lighting scenes that are as varied as possible for different activities such as needlework, reading and watching TV deliver an agreeable living concept
- Diffuse luminaires or luminaires that have a relatively large indirect component, and light colours that are as warm as possible from 2700 to 3500 K accentuate a feel-good atmosphere
- A minimum lighting level ensures night-time orientation; slow dimming and sensors built into beds have proved to be especially useful
- Provide a dedicated reading light near the bed or elsewhere for reading
- Ease of operation is paramount for the elderly



Balanced lighting solutions for residents' rooms

Here the aim is to strike the right balance between residents' needs and care staff's requirements. A high lighting level is only rarely required for examinations. Enabling individualised usage and adjustment of lighting, and integrating daylight achieves the best possible lighting quality and energy efficiency.



- SLOTLIGHT II ⁽¹⁾ light line
- ONDARIA ⁽²⁾ circular luminaire 440/640
- AMALIA ⁽³⁾ reading light
- SUPERSYSTEM ⁽⁴⁾ 1/2.5 W spots
- LINARIA ⁽⁵⁾ light line
- 2LIGHT MINI ⁽⁶⁾ downlight IP44
- DIMLITE ⁽⁷⁾ lighting management system

Lighting quality

- Uniform ambient lighting
- Focused, directional reading light by the bedside and in reading corner
- A light line brightens up a room, giving a natural effect

Energy efficiency

- Intelligent switching and control of lighting cut actual energy consumption



Underlying conditions: resident's room, 4 m x 10 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 Annual energy consumption in kWh per square metre, based on EN 15193

Lighting solutions for other areas

Workplaces in nursing homes

1 Communal spaces



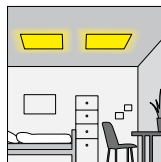
2 Corridors and circulation areas



3 Residents' rooms

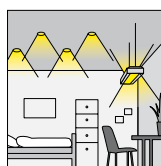


4 Staff room



Standard

With wide-angle light distribution, MELLOW LIGHT V floods the entire room with soft light.



Optimum

The pendant luminaire with LED hybrid technology and LRO optic (ELEEAA) produces high-quality task lighting and a pleasant atmosphere. LED wallwasher (PANOS INFINITY Tunable White) provide biologically effective lighting with adjustable colour temperature.

5 Porter, entrance area



Standard

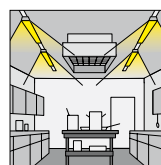
MELLOW LIGHT V provides optimum task lighting as well as a pleasant ambience. The entrance area is illuminated by downlights (PANOS).



Optimum

The pendant luminaire (ELEEAA) with indirect and direct light components turns the reception desk into a fully adequate glare-free workplace. Uniformly backlit light lines such as SLOTLIGHT, for instance, guide visitors automatically in the right direction. Recessed spotlights (VIVO) provide accent lighting for information panels, direction signs and the like.

6 Kitchen



Standard

IP 54 luminaires (PERLUCE, SCUBA) tolerate kitchen vapours and steam. Their housing is easy to clean.



Optimum

Clean-room luminaires (CLEAN) are used wherever the highest hygienic requirements are to be met. They are resistant to oil vapours, chemicals, disinfectants and detergents.

Lighting management and safety

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

Care facilities make heavy demands on lighting. Lighting control makes lighting more sensitive to residents' 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 even more important in care settings because requirements in residents' rooms differ widely from those in staff accommodation and in corridors. Zumtobel has the right solution for every situation.

Convenient operation

It should be extremely convenient for residents and staff to select a lighting scene, regardless whether they use a switch or a remote control unit to do so. Simple controls make allowance for older people 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 emergency lighting can be inspected at any time.

Dynamic daylight sequence

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 savings

Intelligent automation provides a variety of ways for saving energy: a built-in calendar with adjustable time slots can switch artificial light 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 the top priority. This is why Zumtobel offers a unique way of combining general lighting management systems with an emergency lighting system.

The convenient LUXMATE EMOTION touch panel allows perfect lighting control.



ONLITE escape sign and emergency luminaires ensure safety.

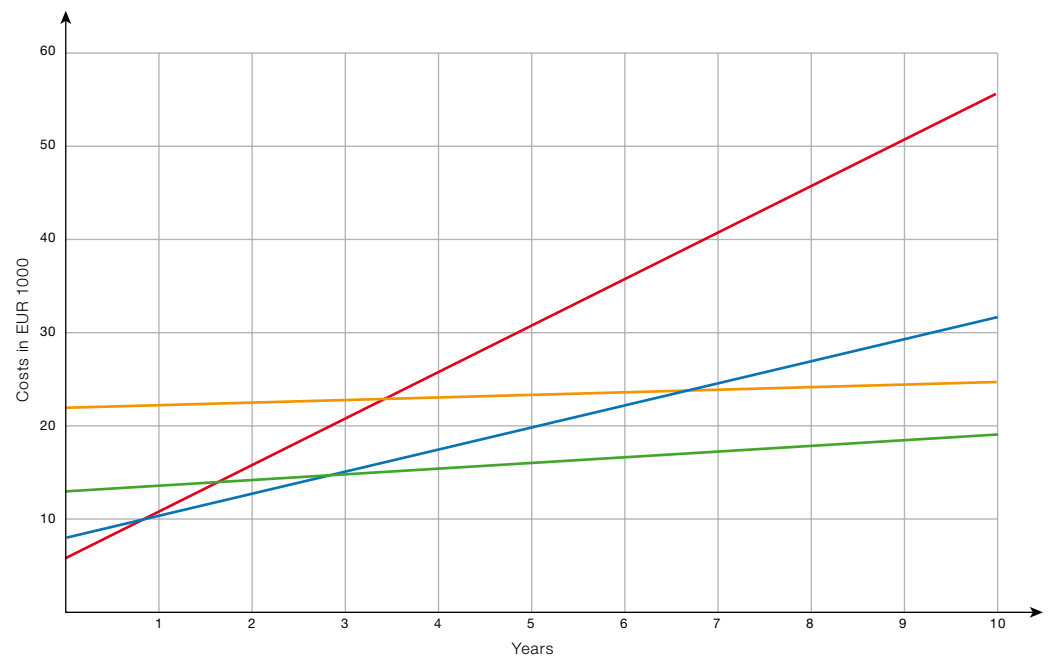


Inspiringly diverse

Many care and nursing homes are based on extensive buildings that have lots of rooms. This requires large numbers of escape sign and emergency luminaires. The costs of testing and maintenance increase with every extra luminaire in the case of a local solution. This means that investment costs are amortised faster with a central emergency lighting system.

Depending on energy requirements and the size of a building, it is therefore advisable to use a group battery or central battery system having an output of up to 30 kW. With such systems, methods of connection, emergency lighting levels, initiation of function and annual system tests are configured from a central location. The installation is monitored and faults are displayed and logged for at least 3 years in an internal test log book. These functions provide massive reductions in the cost of operating a central solution.

Cost savings with a central emergency lighting system



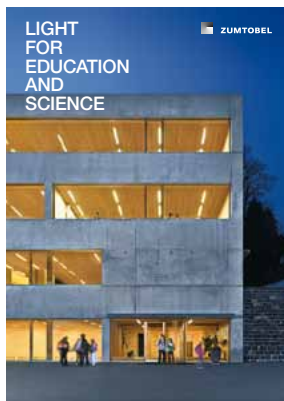
Besides the ONLITE emergency luminaires indicated, general-lighting luminaires can also be used as emergency luminaires, provided appropriate ballasts are fitted. Emergency operation levels can be specified individually for each luminaire, thus minimising the costs of cabling and batteries.

- Control test
- Auto test
- Separate-battery luminaire without monitoring
- Emergency lighting system with central battery





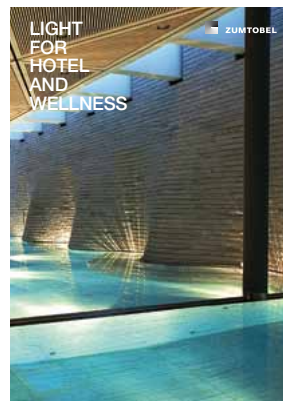
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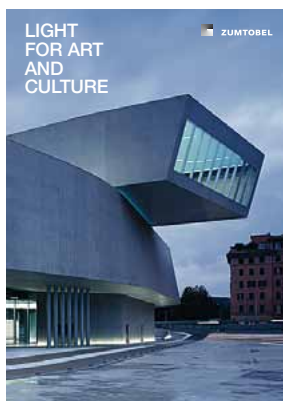
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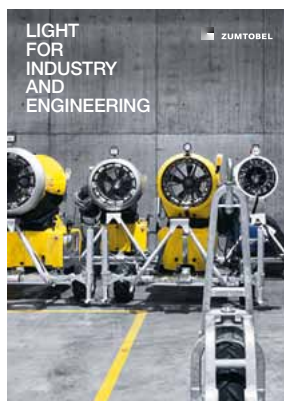
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Zumtobel is the internationally leading supplier of integral lighting solutions for professional interior and exterior lighting applications.

- 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. 04924335-EN 03/12 © 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



Downlights



Wall-mounted luminaires



Recessed luminaires



Surface-mounted and pendant luminaires



Free-standing luminaires



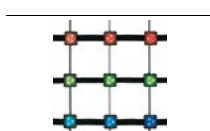
Continuous-row system, individual batten luminaires and modular lighting systems



High-bay luminaires and floodlight reflector systems



Luminaires with extra protection



Building facades and media luminaires



Lighting management system



Emergency lighting



Medical supply systems

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