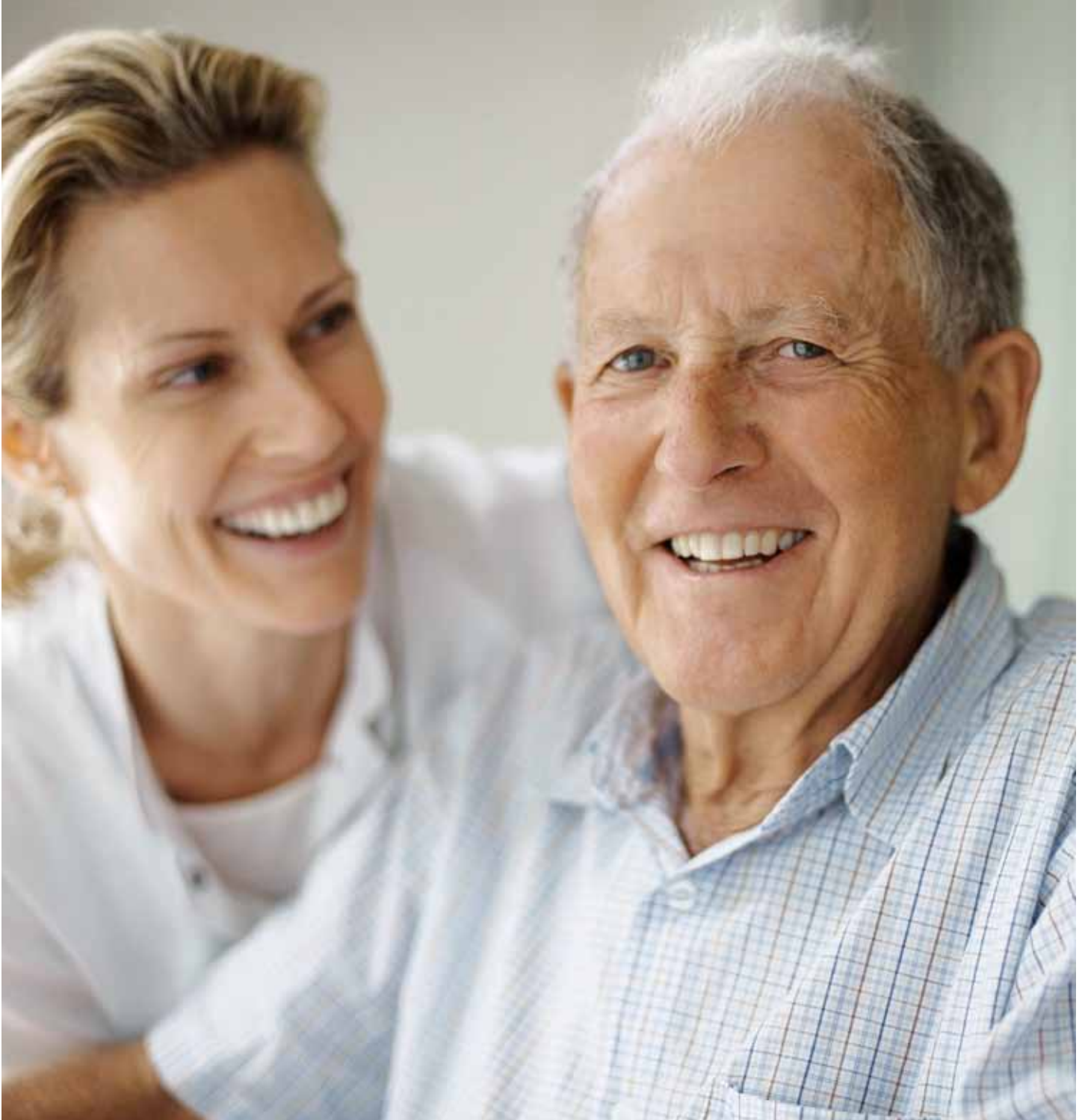


SENIOR CARE

GOOD LIGHTING ENRICHES SENIOR LIVING



# LIGHTING SOLUTIONS FOR ELDERLY HEALTHCARE

## THE IMPORTANCE OF GOOD LIGHT

The statistics on aging show us the challenges ahead in caring for the elderly. There is an increase in life expectancy, which is affecting the way we think about healthcare and the importance of quality in elderly care facilities. The lighting design of these facilities can have a great impact on the overall effectiveness for the staff, patients/residents and visitors. Derungs Licht AG has been addressing the needs of the healthcare industry for over 65 years. Experience and education has made us experts in the specific needs of elderly care facility lighting.

### Lighting for the elderly

Light can stimulate the mind, emotions and the circadian rhythm. It enables us to decipher when things start and end, colors as well as shapes. As vision deteriorates with increasing age, the elderly have to cope with the effects of inadequate lighting. Age-related hearing problems are often offset by visual speech interpretation like lipreading. An 80-year-old person requires on average ten times the illumination level of a young adult. Age-related illnesses such as dementia also need to be taken into account. The effective use of light helps people who are suffering from an illness to better cope with symptoms, and it promotes independence and mobility. Thus, a custom lighting design that addresses these needs is important to a successful and effective interior design of elderly care facilities. Proper and adequate light can also promote the best in quality of life despite the circumstances.

### Lighting for healthcare staff

Caring for the elderly and for people who are ill can be a challenging task for the healthcare staff. It can push care providers to their physical and psychological limits. Our custom lighting solutions provide the best possible visual conditions for the staff. By enabling efficiency, quality and productivity through lighting, healthcare providers can feel their own sense of well-being in the workplace.

### Lighting for visitors

Light affects the way we perceive space in terms of dimension, color, material, and atmosphere. It should convey a sense of well-being and safety to enhance the visual perception of the establishment. In this way, the lighting design can actually help to promote the facility.

### Lighting for healthcare facility owners

High-performance, quality materials, energy-saving and durable luminaires along with superior engineering and workmanship are all reasons why our lighting solutions help facility owners feel confident they chose Derungs.

### Derungs lighting solutions: Creating great environments

Inconspicuous but highly effective—that's what we demand of our lighting designs. Everybody has to feel accommodated in the same way: residents, care providers, and owners. Our state-of-the-art lighting solutions provide homelike comfort and safety. Our lighting design systems are adaptable and they create an environment conducive to communication. Derungs' luminaires are inconspicuous yet effective.

The combination of different light effects produced by high intensity lights, care lights, reading or work lights, general lights, examination lights, nightlights and guide lights enables us to provide lighting solutions tailored to meet the demands of every target group. We use indirect and direct lighting on ceilings, walls and floors as well as multi-purpose reading lights to produce different light effects.

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# BROCHURE GUIDE

## ICONS TO HELP ORGANIZE INFORMATION

Lighting solutions in elderly care facilities are extensive and multi-faceted. There are many factors to consider regarding each and every custom lighting solution. The icons below are used throughout this brochure to organize information and help give you clarity on the importance of lighting in elderly care facilities.

### Organization of the brochure

This brochure will start with the definition of terms and an explanation of factors that may affect professional lighting systems for healthcare facilities. First, several elderly health issues will be defined. Then, overall solutions for good lighting, basics for planning, high-performance lighting systems will be discussed. Finally, this brochure will conclude with the benefits in using Derungs as your elderly healthcare lighting expert and a listing of product lines.

Derungs is dedicated to the education of lighting in the healthcare industry, as well as providing outstanding products and service as solutions.

The icons below represent three separate sections in this brochure to help clearly illustrate its purpose.

### Issue



### Solution



### Products



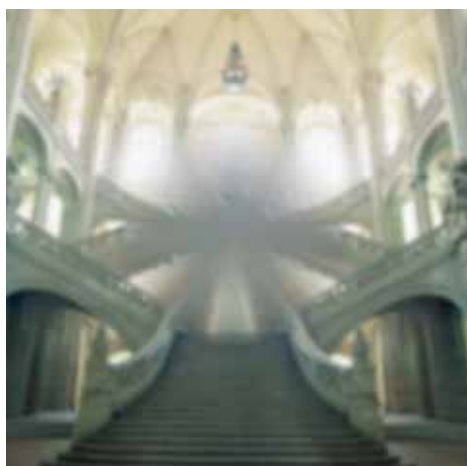
# HEALTH CONCERNS OF THE ELDERLY

## VISUAL IMPAIRMENTS

The elderly and people afflicted with dementia often suffer from vision and perception issues. Studies have shown that adequate lighting provides the key to maximizing self-sufficient and accident-free living as much as possible. A professional lighting design can offset these issues and add to the quality of life for the patient.

### Macular degeneration

Impairment of central vision; affects reading ability, objects appear blurry, difficulty in discriminating colors



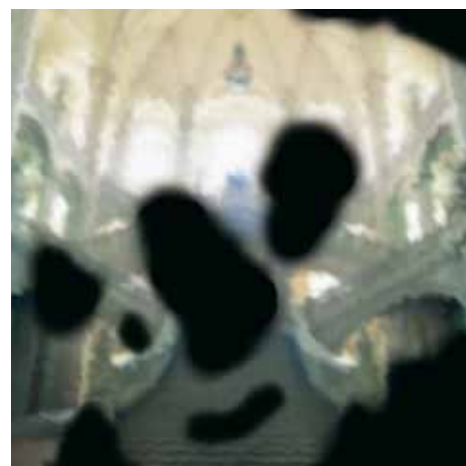
### Cataracts

Clouding in the variable lens; vision becomes foggy or blurred



### Diabetic retinopathy

Vision becomes blurred and distorted; dark spots, complete loss of vision



### Glaucoma

Increased fluid pressure in the eye, optic nerve fibers die due to lack of blood, hemianopsia



### Retinitis pigmentosa

Difficulties adjusting to brightness/darkness, night blindness, sensitivity to glare, tunnel vision







# HEALTH CONCERNS OF THE ELDERLY

## DEMENTIA

Fifty percent of all adults will need long-term care at some time according to research, and the trend is growing. Dementia is an enormous challenge for patients, care providers and relatives. The patient environment needs to be professionally designed to compensate for the changes in abilities like cognition and perception. Professional lighting significantly contributes to a successful environment in elderly care facilities. It helps ensure the highest level possible of patient independence as well as the physical and mental health of patients. Proper lighting solutions can also allow the healthcare professional to clearly and accurately handle tasks.

### Understanding dementia

Imagine all of your memories were chronologically kept in a book. You can only remember what is recorded on these pages. Suddenly 'dementia' comes along and starts to tear pages out of your book, beginning with the last pages.

Dementia involves the progressive decline of mental abilities accompanied by changes in personality. Carrying out daily activities without help becomes difficult and sometimes impossible. Symptoms that further burden daily life include memory loss, loss of speech, difficulties with recognition and perception, difficulties with time and place orientation, and changes in behavior. The environment becomes more and more confusing to the dementia patient. It becomes more difficult to adequately process and react to environmental stimuli.

Secondary symptoms may involve anxiety, flight rather than fight, depression, passiveness, aggressive behavior, and manic delusions.

Patients with dementia require intensive support and care, often around the clock. Keeping this population of patients as self-sufficient and mobile as possible is not only in line with common social values but also the decisive factor in reducing the workload of care providers.





Customized lighting solutions can motivate the elderly to stay self-sufficient and can also help facilitate the daily routines of healthcare providers.







# EFFECTS OF AGE-RELATED HEALTH ISSUES

## ISSUES: FALLING AND SLIPPING / ANXIETIES

Falls, feelings of insecurity and anxiety can be significantly decreased by providing adequate lighting. This in turn results in a higher degree of independence, safety, comfort and contentment.

		<p><b>Falls</b></p> <p>Falls and possible fractures like femoral neck fractures, may involve major surgery and an extensive recovery period. Complications during treatment may even mean immobility and no longer being able to carry out daily activities.</p> <p>1a) Unfavorable illumination levels and light conditions 2a) Reflections on floor caused by one direct light</p>	<p>Common causes of falling due to poor lighting:</p> <ul style="list-style-type: none"> <li>• Obstacles are not recognized in time due to glare</li> <li>• Bright/dark transitions cause eye strain in older people</li> <li>• Hard shadows / Shiny spots are interpreted as obstacles and lead to false steps</li> <li>• Shadow of door handle is thought to be the door handle itself</li> </ul>
			

		<p><b>Anxieties</b></p> <p>Residents often interpret passing shadows or other optical illusions as a threat. This in turn causes anxiety and fear which may lead to aggression. Shadows on peoples' faces may cause angst, especially if vision is impaired.</p> <p>Reflections are often the cause of irritability and insecurity. Patients with dementia often interpret these as obstacles or as optical illusions. Floor reflections are often thought to be water.</p>	<p>Dark ceilings without indirect lighting feel restrictive and unsafe.</p> <p>1a) Dark shadows on various facial features (images: reproduction and/or publication with permission from Verwaltungs-Berufsgenossenschaft, Deelbögenkamp 4, 22297 Hamburg)</p> <p>2a,b) Passing shadows, door handle with shadow</p>
			



# EFFECTS OF AGE-RELATED HEALTH ISSUES

## ISSUES: PASSIVENESS / DISORIENTATION

The need to actively engage in daily activities and in social life continues to exist even after moving to a private or public senior care facility. Adequate lighting helps seniors to manage their daily routines more independently.

### Passiveness

People in need of care still need to maintain their own level of independence. Being able to move freely helps them better understand the environment they live in and it promotes social behavior with other people in the healthcare facility. Poor lighting may trigger fear and discourage the elderly from carrying out daily activities independently. The result is passiveness, discontentment, depression or even aggressive behavior.

Adequate lighting assists the elderly in better finding their way around safely and independently. They feel encouraged to move about and they are more likely to participate in social activities. Therefore, the overall atmosphere throughout the facility is significantly enhanced.

### Disorientation

Disoriented patients often feel worse in poorly lit rooms. This is because objects throughout the room lack contrast, therefore making it difficult to see shapes and details clearly. The perception of depth can be severely limited which makes it difficult for the patient to see the beginning and the end of objects.

Corridors, staircases and recreation areas can become hazard zones with poor lighting because the patients may lose their bearings out of confusion. The ability to move about independently decreases drastically; almost every step requires the assistance of a care provider.

The systematic use of light substantially contributes to optimizing the general sense of spatial perception.

Dark with shadows and glare



Clear, bright environment  
D-lite® amadea



Clear, bright environment  
D-lite® amadea



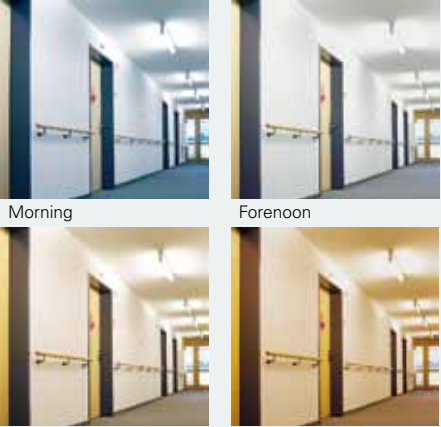




# EFFECTS OF AGE-RELATED HEALTH ISSUES

## ISSUE: THE DISRUPTION OF THE CIRCADIAN RHYTHM

The circadian rhythm helps the human body adjust to the patterns of daily processes. It controls everyday human physiological processes like metabolism and hormone production and the awake/sleep cycle with remarkable accuracy. Light acts as the body's "timer" in the process. If natural light is not available to regulate our inner clock, then a lighting solution that provides an adequate substitute for natural daylight is required.



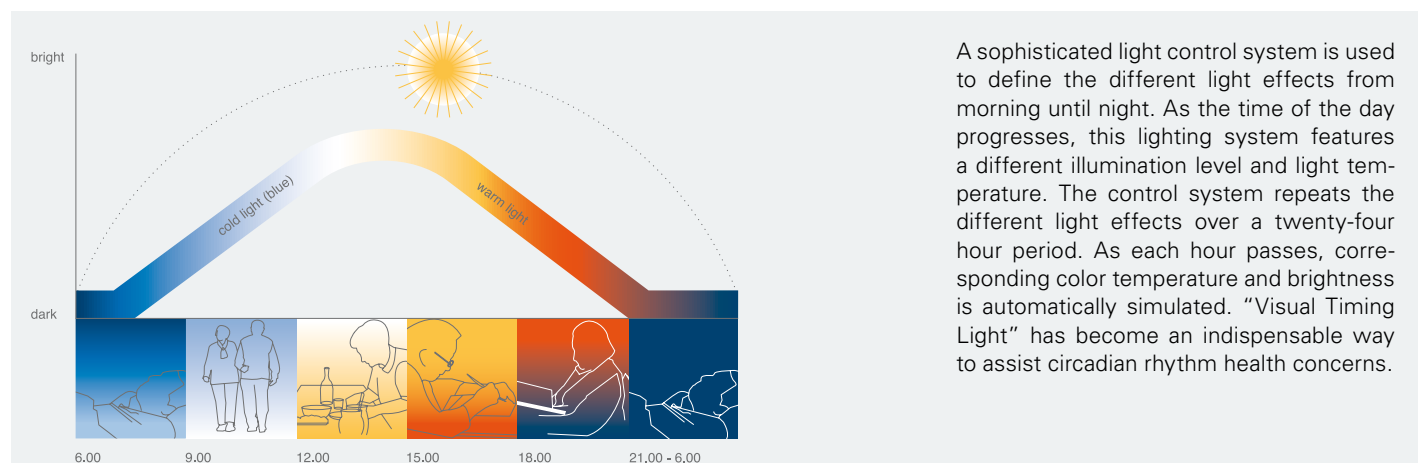
Morning
Forenoon
Afternoon
Evening

**The disruption of the circadian rhythm**

Patients with dementia have difficulties with spatiotemporal orientation. This leads to implications of inactivity, confusion and depression.

"Visual Timing Light", the innovative light management system from Derungs Licht AG uses artificial light to simulate the twenty-four hour cycle, from sunrise to sundown and night-time.

- Twenty-four hour cycle of light to organize daily course of activity
- Positively affects the day / night cycle
- Helps balance hormone production
- Regular sleeping and eating habits
- Positively affects mood and sense of well-being; invigorates the senses
- Compensates for mood fluctuations and depressions
- Enhances overall performance
- Significantly improves articulation of patients with dementia

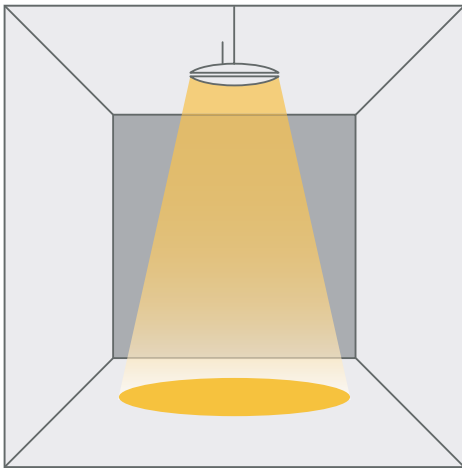




# HOW LIGHT AFFECTS THE QUALITY OF LIFE

## CUSTOM LIGHTING IS A SOLUTION – KEY FACTORS IN ADEQUATE LIGHTING

This section describes the factors needed for adequate lighting. Derungs Licht AG combines and adapts these to meet the specific needs of adult care facilities. Effects of age-related deficiencies can consequently be substantially reduced.

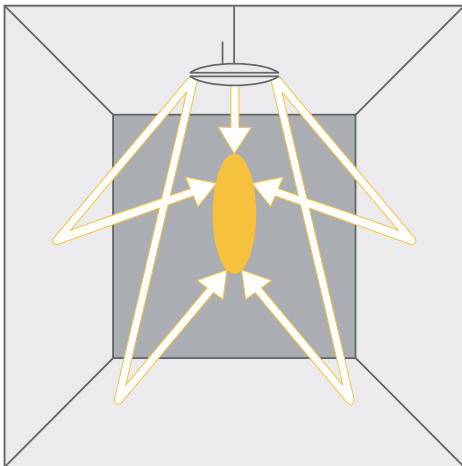


### Illumination level

One of the most significant factors for room illumination is the illumination level measured in "lux" or "footcandle". It defines the intensity of light emitted over a given area. Due to the deterioration of vision, the elderly need a higher illumination level to be able to cope with daily tasks. The threshold areas between light and dark such as entryways have to be kept brightly lit, especially on the inside, to help the eye better adjust to the inside when entering from the brighter outside.

Adequate illumination levels reduce feelings of insecurity, the risk of accidents, anxiety, and passiveness among other things.

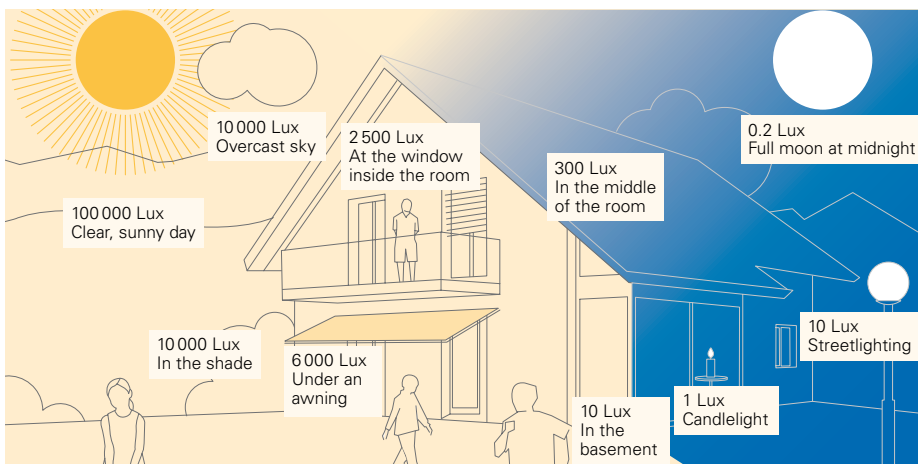
See page 14 for specifics on illumination recommendations for different rooms.



### Cylindrical illumination

Cylindrical illumination is the quantifying parameter for the lighting level of vertical or virtually vertical object surfaces in a room. It is also applied as a standard for determining the brightness in a room and, in particular, the brightness of faces. Ideal cylindrical illumination enhances the recognition of faces, door handles, light switches, colors, and more.

Quality components along with innovative reflector and prism technology allow Derungs Licht AG solutions to achieve optimal cylindrical illumination.



This diagram represents the various approximate illumination levels in everyday life.



# HOW LIGHT AFFECTS THE QUALITY OF LIFE

## CUSTOM LIGHTING IS A SOLUTION – KEY FACTORS IN ADEQUATE LIGHTING



Direct lighting



Indirect lighting



Direct / Indirect lighting



Twin-component lighting

### Features of poor light diffusion

#### *Direct lighting*

- + very good to average energy efficiency
- discomforting glare for patients confined to bedrest
- reflective glare on equipment and objects
- dark shadow on facial features and objects
- faces not bright enough for visual communication
- reflections on the floor
- room appears to be dark

#### *Indirect lighting*

- + excellent glare control
- + minimum reflections
- + room appears to be bright
- + hardly any shadows
- average to poor energy efficiency
- ceilings are too bright for patients confined to bedrest
- diffuse lighting atmosphere (hardly any contrasts)

### Features of good light diffusion

#### *Direct / Indirect lighting*

- + good energy efficiency
- + hardly any shadows
- + hardly any reflections
- + good glare control
- + room appears to be bright
- + homogeneous, soft transitions due to multiple reflectance

#### *Twin-component lighting*

- + like direct / indirect lighting
- + partial amplification of lighting due to task / reading lights

Derungs Licht AG understands the significance of direct / indirect lighting and twin component lighting. The light fixture product range focuses on providing lighting solutions in these areas. Our priority is to provide excellent lighting solutions that use a basic principle: provide indirect lighting while diffusing direct light to properly balance the atmosphere safely and effectively.



# HOW LIGHT AFFECTS THE QUALITY OF LIFE

## CUSTOM LIGHTING IS A SOLUTION – KEY FACTORS IN ADEQUATE LIGHTING

### Color of light

The color of light describes the color impression of the light and is expressed as color temperature. Warm-white color temperatures have a greater amount of red and yellow hues, such as for candles and incandescent light (below 3300 Kelvin). Warm-white light is comfortable and cozy in most atmospheres. Neutral-white light contains a greater amount of blue hues (3300-5300 Kelvin), daylight-white contains a large proportion of blue hues (more than 5300 Kelvin); these are required

when providing adequate lighting for steps, staircases, entryways and exits or for demanding activities at work. Fluorescent lamps are available in any color of light, from warm-white to daylight-white.

### Color rendition

The spectral properties of the light source are important because the perceived color always depends on the spectral composition of the light.

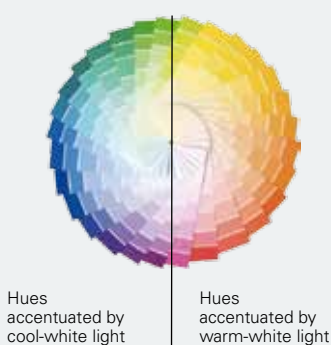
The general color rendering index “Ra” is used to describe the color rendition properties of light sources. This index defines how ‘well’ the colors of an object are rendered by a light source compared to a reference light source (incandescent light or daylight).

The highest Ra value is 100. Ra 100 means that all colors of a given object appear to be most natural (no apparent changes in color) with this light source. The greater the deviation from Ra 100, the poorer the colors of a given object are rendered with the defined light source.

Fluorescent lamps feature an excellent color rendition level of 1B with a Ra from eighty to ninety and should consequently be used for interior lighting. Lamps that provide the

highest color rendition (level 1A) of a Ra exceeding ninety are required for color-critical applications (skin examinations, medical treatments, surgeries). They often, however, deliver less light and are more expensive.

### Colors of light define interior spaces



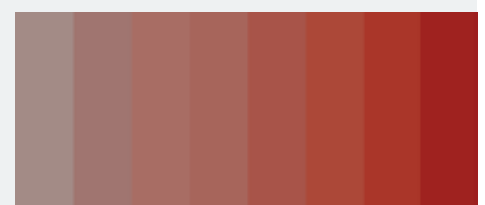
### Properties of color rendition

Poor properties of color rendition make it impossible for the eye to recognize all existing colors.



Poor

Good properties of color rendition make it possible for the eye to see all actual existing colors.



Good



# HOW LIGHT AFFECTS THE QUALITY OF LIFE

## CUSTOM LIGHTING IS A SOLUTION – KEY FACTORS IN ADEQUATE LIGHTING

### Glare control

The eyes of the elderly are more sensitive to glare than the eyes of younger adults. Light is diffused differently in older eyes. There may be deposits in the eye which can cause cloudiness by forming a film across the retina. This film hides details and can make it difficult to differentiate between objects.

Derungs Licht AG products come equipped with diffusers with each clear glass incandescent or halogen lamp to help control glare.

### Environment

Light affects emotions and moods and light can convey a sense of comfort and of feeling safe and secure. The elderly should feel comfortable in their environment. In addition, the care providers need to work in a bright, motivating environment.

Derungs Licht AG creates healing environments by taking into account all the variables in the lighting design. Light can be used to create a comfortable environment, so that objects appear clear and the room safe.

### Light distribution

By using light to brighten walls, corridors appear wider. Indirect ceiling light fixtures make rooms seem more inviting and open.

Derungs Licht AG can precisely define the emitted light by using specially designed, light directing elements. The light is directed into the room in an optimal fashion. The room is illuminated uniformly. This creates illumination that is comfortable and low in glare, reflections and shadows.

### Reflection control

Reflection on shiny surfaces is not safe and causes strain on the eyes. Shiny surfaces do exist almost anywhere in adult care facilities: painted table tops, metal panels, mirrors, glass cabinet doors, pictures in glass frames, glossy flooring, etc. Disturbing reflections occur when a bright light source is mirrored in the line of vision.

Derungs light solutions keep reflections to a minimum by using diffusers with both direct or indirect lighting. Derungs' luminaires control the light through sophisticated light directing prisms. In this way, shiny surfaces are not spot-lit and reflections are minimized.

### Shadow control

The interplay of light and shadow is indispensable in safely finding one's way around a room and in recognizing objects. Concentrated light sources and bundled light create lighting that promotes the formation of sharp and deep shadows. This produces sharp contrasts that may conceal objects or obstacles with dark shadows. Using light sources that cover an extensive area and radially diffuse the light, as is done, for instance, with ceilings illuminated by indirect lighting, creates illumination that casts few shadows. Shadows necessary for orientation, however, are missing. The shapes are no longer recognized and obstacles may not be perceived as such. The objective consequently has to be to provide illumination that produces an average degree of shadiness. Derungs Licht AG customizes lighting systems to meet the unique needs of the customer and to produce just the right degree of shadiness by utilizing the benefits of top-quality indirect / direct lighting and twin-component lighting systems.





# PREPARING A LIGHTING DESIGN

## IMPORTANT BASICS FOR PLANNING

At the heart of each one of our lighting designs is the goal to provide functional illumination by use of multiple lighting components. The luminaire itself should not dominate the overall room light levels, but rather allow for the correct balance of light while giving the designer freedom to customize it further.

When preparing a new lighting design, many factors have to be taken into account and coordinated, including financing, architectural specifications, needs of a wide variety of clients and the way daylight enters the rooms. The professional planning of illumination requires considerable expertise and partnership. We will work with you to create the best in custom lighting solutions as your professional lighting partner.

### Illumination recommendations

VDI Directive 6008: Barrier Free Buildings for Living

IESNA: Recommended Practice for Lighting and the Visual Environment for Senior Living

(1 footcandle = 10.76 Lux)

Area	Light effect	Illumination level E[lx]	Color of light	Type of lighting
Corridors	day lighting close to floor (10 cm above floor) eye level (140-160 cm above floor)	200-300 lux 300-500 lux (cylindrical)	warm-white/neutral-white warm-white/neutral-white	direct / indirect direct / indirect
	night lighting, close to floor	50-100 lux	warm-white/neutral-white	direct / indirect
Recreation areas	day lighting, close to floor	200-500 lux	warm-white/neutral-white	direct / indirect
Residents' rooms	care light bed level (85 cm above floor)	300-500 lux	warm-white/neutral-white	direct / indirect, twin-component lighting, depending on type of care
	reading light, work light bed level / eye level (separate auxiliary lighting, if needed)	300-1000 lux	warm-white/neutral-white	direct / twin-component lighting
	living room light, close to floor	100-500 lux	warm-white	direct / indirect
	night light, close to floor monitoring lights for staff at night, close to floor	50-100 lux approx. 5 lux	warm-white warm-white	indirect indirect
Restrooms	For patients: basic lighting close to the floor; accent lighting at face level	200-500 lux	warm-white/neutral-white	direct / indirect



# SPECIFIC LIGHTING

## RECREATION ROOM, CORRIDOR AND STAIRCASE LIGHTING

A homelike atmosphere can be created through using light throughout the entire healthcare facility. Patients often use the corridor as additional living space due to the size of their living quarters. When the weather is not conducive for walking outside, the elderly often use the corridors and staircases for such activities. Patients with dementia often prefer to stay indoors even in the summer. Properly illuminated corridors can become meeting places and a viable option for physical activity.

### Light helps guiding

The elderly tend to use lighting for orientation. They will walk in lit areas and avoid the dark. We can create brighter lit and dimmed areas to help provide some direction.

#### *Examples:*

Reduce the illumination level toward the exit, if patients with dementia are not to leave the station. Increase the illumination level to draw people to a specific area that is to be used for social gathering.

If certain corridors provide an opportunity for walking around, they should be illuminated brighter than the secondary corridors. For instance, you can use light to accentuate doors for restrooms and recreation rooms.

Room accessories can be accentuated by combining wall lights with ceiling lights that can be switched differently.

Corridors without direct daylight are rather common. The ideal lighting solution ensures that corridors and alcoves are well-lit, even if there are no windows.



### Safety on staircases

Safety on staircases is a top priority to healthcare facilities. There are specific requirements staircase lighting must meet:

- Lighting that casts fewer shadows on steps makes them more visible. An additional way of making steps easier to be seen and making them easier to walk on is to use different paints or materials for the steps
- With partial indirect lighting false shadows and self-occlusion are avoided



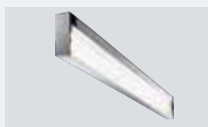
# CORRIDOR AND STAIRCASE LIGHTING

## CEILING LIGHTS

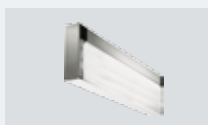
D lite® **vanera**



54/54 C, 2x54 C



2x28 C \*



2x24 C



Award Winner

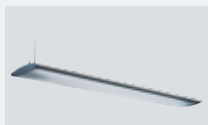
- General indirect / direct light
- Ideal light distribution, casts few shadows, minimum reflection, no glare
- Ceiling mounted, perfectly suitable for low ceilings < 2.3 m
- Modular set-up regarding materials, design, functionality and technology
- On request: Toolbox Spot (accent lighting), Toolbox PS (DALI control system), three-hour battery-operated emergency lighting, Visual Timing Light (see p. 9)

\* Luminaire Minergie (sustainability)

D lite® **amadea**



54/54 C, 2x54 C



2x28 C \*



- General indirect / direct light
- Excellent light efficiency and light effect due to DRS Double Reflecting System and T5 fluorescent lamps
- Luminaire Minergie (sustainability)
- Suitable for various ceiling heights (min. 2.5 m) as the pendant length is adjustable (20 cm to 150 cm)
- Homogeneous and uniform ambient lighting
- Light is low in glare, reflectances and shadows
- Creates good visibility and safety

\* Luminaire Minergie (sustainability)





# CORRIDOR AND STAIRCASE LIGHTING

## WALL LIGHTS

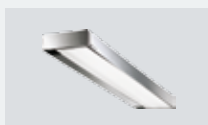
D lite® **vanera**



2x39 W



2x28 W \*



2x24 W



Award Winner

- General indirect / direct light
- Special polymer prisms ensure ideal, asymmetrical light direction. The low light density on the walls ensures uniform ambient lighting and a comfortable light low in glare, reflectances and shadows.
- Modular set-up regarding materials, design, functionality and technology
- On request: Toolbox PS (DALI control system), three-hour battery-operated emergency lighting, Visual Timing Light (see p. 9)
- \* Luminaire Minergie (sustainability)

D lite® **amadea**



Compact 55 W



2x39 W

- General indirect / direct light
- Excellent light efficiency and light effect due to DRS Double Reflecting System and T5 fluorescent lamps
- The low light density on the walls ensures uniform ambient lighting and a comfortable light low in glare, reflectances and shadows.
- Modular design of wall unit allows accommodation of additional components
- Three-hour battery-operated emergency lighting



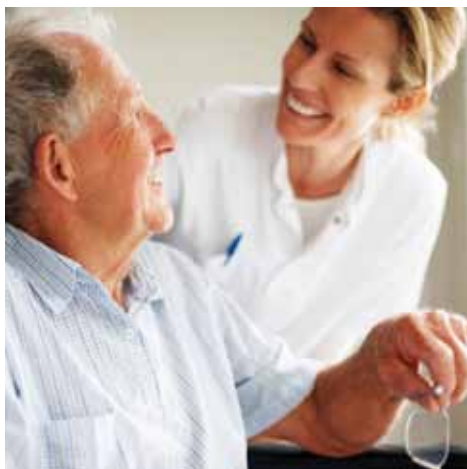




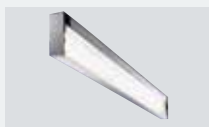
# RECREATION ROOM LIGHTING

## CEILING LIGHTS

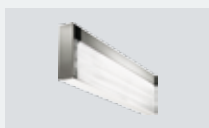
D<sup>lite</sup>® **vanera**



54/54 C, 2x54 C



2x28 C \*



2x24 C

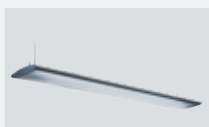


Award Winner

- General indirect / direct light
- Ideal light distribution, casts few shadows, minimum reflection, no glare
- Ceiling mounted, perfectly suitable for low ceilings < 2.3 m
- Modular set-up regarding materials, design, functionality and technology
- On request: Toolbox Spot (accent lighting), Toolbox PS (DALI control system), three-hour battery-operated emergency lighting, Visual Timing Light (see p. 9)

\* Luminaire Minergie (sustainability)

D<sup>lite</sup>® **amadea**



54/54 C, 2x54 C



2x28 C \*



- General indirect / direct light
- Excellent light efficiency and light effect due to DRS Double Reflecting System and T5 fluorescent lamps
- Suitable for various ceiling heights (min. 2.5 m) as the pendant length is adjustable (20 cm to 150 cm)
- Homogeneous and uniform ambient lighting
- Light is low in glare, reflectances and shadows
- Creates good visibility and safety

\* Luminaire Minergie (sustainability)





# SPECIFIC LIGHTING

## HEALTHCARE ROOM LIGHTING

Patient room lighting should create an inviting and safe environment. Sufficiently bright yet warm along with being glare-free are just a few of the variables needed to consider successful lighting solutions. Our philosophy of providing custom lighting for each healthcare room starts with the education of light and how it can be maximized for each application.

Various lighting effects can be selected depending on your custom needs:

### General lights / Ambient lights

The general lighting in a room should coincide with daylight to create the correct amount of light. Ambient lighting appears to be bright and natural, does not strain the eyes and is rarely perceived as being artificial. The ideal distribution of direct and indirect light allows us to see far and near objects without producing a discomforting glare, and is easy on the eyes. The lighting should be designed to meet the environmental needs of the room resident. A more intense light can be chosen, for instance, for periods of activity and a warmer light for a cozy “sundown effect”.

### Reading lights / Work lights

The correct combination of glare-free, ambient lighting and precise bedside reading light creates a safe and functional environment for patients and staff. Safety must come first, thus very little heat should be generated in the reading area. There should be no risk of getting burned or fire from the light or its surface. Bedside lights not only have to provide the patients with adequate lighting for reading but must be easy to use and glare-free.

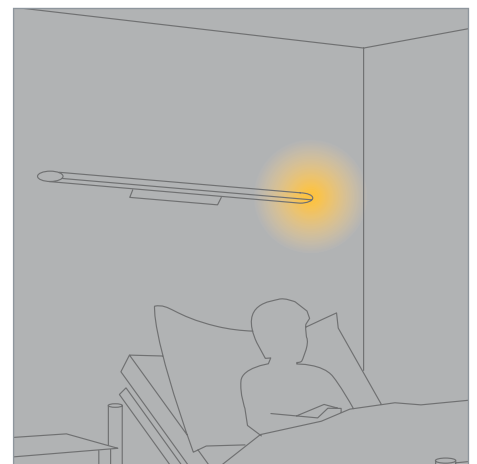
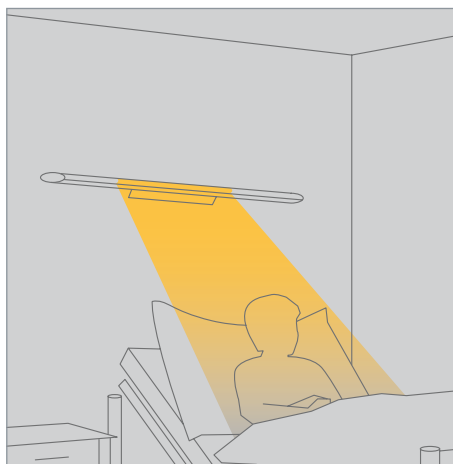
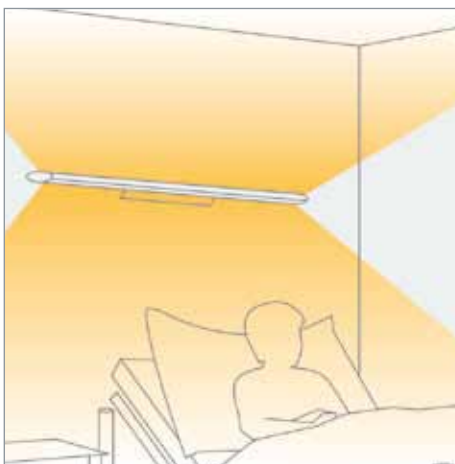
### Care lights / Examination lights

The healthcare patient room is a “workstation” for the staff. The lighting has to be adequate enough to provide patients with general care like checking the skin, changing bandages, giving injections and infusions, and other tasks. Adequate lighting facilitates the tasks of the care providers.

Patients and care providers are often in their own shadow of the light. Illumination features have to meet the following requirements according to care providers: no glare light that casts few shadows with a large lighting radius; ease of use; and the perfect illumination level depending on the application.

### Night lights / Guide lights

Night lights provide a subtle guiding light for staff in the dark without disturbing the patient.





# SPECIFIC LIGHTING

## HEALTHCARE ROOM LIGHTING



### Indirect / direct wall lighting

- Provides patients and care providers with comfortable ambient lighting. Use of indirect light
- Provides the patient with a comfortable reading and work light. Use of direct light
- Ensures the care providers with high-intensity light suitable for examinations. Self-occlusion is avoided due to the sophisticated light direction system. Use of indirect and direct lights
- Provides patients with a subtle night light to safely guide their way in the dark and it facilitates the work of care providers on their nightly rounds

### Twin component lighting

Adjustable bedside reading / care light to supplement wall lighting:

- Provides the patient with focused reading or work lighting
- Assists the staff with high-performance lighting in providing daily care

### Variable use

Position bed as needed:

- Can be accessed from one side (minor care needed); see top figure
- Can be accessed from two sides (intensive care needed); see bottom figure







# HEALTHCARE ROOM LIGHTING

## WALL LIGHTS

### D<sup>lite</sup>® **vanera** Bed



54/54 W



39/39 W

- Indirect general light  
Direct reading light  
Indirect / Direct examination light  
LED or DALI night light  
(Light effects can be switched separately)
- Special polymer prisms ensure ideal, asymmetrical light direction, uniform ambient lighting and a comfortable light low in glare, reflectances and shadows
- Modular set-up regarding materials, design, functionality and technology
- On request: Toolbox Socket (line current)  
Toolbox PS (DALI control system)

### D<sup>lite</sup>® **amadea** Bed



54/54 W



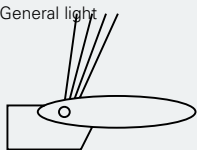
39/39 W, 2x39 W

- Indirect general light  
Direct reading light  
Indirect / Direct examination light  
night light
- Light effects can be switched separately or they can be dimmed, on request
- Excellent light efficiency and light effect due to DRS Double Reflecting System and T5 fluorescent lamps
- Available with 2x54 W and 2x39 W plus 24 W reading light

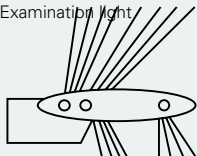
Night light



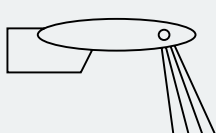
General light



Examination light



Reading light





# HEALTHCARE ROOM LIGHTING

## READING LIGHTS

Dcare® **amalia**



9 P S4



9 P S7



9 B S8

- Optimal light intensity with a reduced current consumption
- Large range of movement thanks to the flexible arm and the foot joint
- Luminaire head turns 360°
- Backlighting switch for an easy use of the LED reading and night light in the dark
- Reduced heat generation
- Sturdy general construction and longlife light source
- Extremely energy-saving thanks to the use of very efficient LED's

Dcare® **medicool**



14 P F1



14 P S3

- Glare-free reading light
- Luminaire for minor examinations and care
- Spring-balanced arm or gooseneck arm
- Guide light on luminaire head for ease of use in the dark
- Minimal heat generation
- Shield prevents direct contact with lamp
- 14 W compact fluorescent lamp

Dcare® **cosy** / Dcare® **cosy** LED



20 W S0



20 P S3



S 20 P S3



LED 12 P S3



LED S 12 P S3

20 W halogen lamp

- Glare-free reading light
- Cord switch with LED
- Twin-wall housing minimizes
- Shield prevents direct contact with lamp

12 W LED

- No high heat generation
- Energy conservation up to 40 %
- Direct current give an above-average good electromagnetic compatibility value
- Long service life

LED





## SPECIFIC LIGHTING

### RESTROOM LIGHTING

The day begins and ends in the restroom. The reflection of the patient in the restroom mirror in the morning and at night often influences how he perceives himself. Restrooms are often too small to be an oasis of serenity and wellness. All the more reason to create a comfortable atmosphere in the restroom with uniformly distributed, no-glare and well-screened lighting.

#### Lighting up the restroom

- Soft and homogeneous ambient lighting
- Minimizes shadows and reduces risk of falls
- Floor is easy to see when entering the shower because of low-shadow lighting
- Reduced reflective veil on face and body facilitates professional physical care and tending of wounds
- Ideal color rendition features ensure color authenticity of face and body in mirror
- Improves patients' self-perception
- The restroom as an oasis of serenity
- Splash-proof IP 44 ensures high degree of safety
- Vanity sink, mirror and lighting blend to form one esthetic unit
- Compact luminaire design creates a slim, linear outline

Version Standard with front cover  
D<sup>lite</sup>® **vanera** Bath



Version Eco without front cover  
D<sup>lite</sup>® **vanera** Bath Eco



Version Standard with front cover  
D<sup>lite</sup>® **vanera** Bath









# RESTROOM LIGHTING

## WALL LIGHTS



D<sup>lite</sup>® vanera Bath



2x24 W

- General indirect / direct light
- Soft and homogeneous ambient lighting
- No reflective veil on facial features
- Floor is clearly visible due to low-shadow lighting
- Vanity sink, mirror and lighting blend to form one esthetic unit
- Splash-proof IP 44 ensures high degree of safety





## DERUNGS OFFERS ADDITIONAL BENEFITS

### SAFETY, QUALITY, ERGONOMICS, ECONOMICS

At Derungs, we take into account the detailed aspects of custom lighting solutions. Safety, quality, ergonomics and the economics play a vital role in the design and production of our luminaires.

#### Bedside reading lights should be equipped with a safety catch

- Luminaire cannot be unintentionally removed from bracket (risk of accident / damage to luminaire)

#### External surfaces of medical luminaires should be smooth

- Easy to clean and disinfect

#### Cable should be in arm joint

- No exposed wires or springs that might endanger the patient
- Easier and safer to clean

#### Low heat generation

The unique design of Derungs luminaires in conjunction with high-performance technology ensures that little radiant heat is emitted and that the heat generated on the luminaire body is kept to a minimum. Even if the luminaire has been on for an extended period, hazards due to excess heat (risk of getting burnt / risk of fire) are eliminated.

#### Guide light

- Helps the patient find the lamp switch even in the dark

#### Spring-balanced joints

- Easy to use
- Easy positioning
- No unintentional tilting of luminaire (risk of accident / risk of fire)
- Reduced maintenance

#### Ergonomic handles to position the luminaire

- Switch and night light switches are located near the handle
- Special textured surface (notches) help guide people with visual impairment

#### LED

- Increased energy efficiency
- Consistently maintenance free thanks to long LED life
- Cold light - no heat radiation in the light

#### Energy efficient luminaires

- Low energy, high-performance
- Large lighting radius that is shadow-free
- Low heat (no excess heat for the patient, no risk of fire)
- Long service life (15,000 h) = virtually maintenance free

#### Halogen lamps

- Comfortable but "spotty" light
- Dichroic lamps emit less heat in the direction of light
- Housing with good heat dissipation
- Additional protection (second glass shield) from contact with the hot light source
- Spacer, so that the luminaire does not lie flush on a given surface at any time (overheating)



## DERUNGS OFFERS ADDITIONAL BENEFITS

### SAFETY, QUALITY, ERGONOMICS, ECONOMICS

#### Shield

The purpose of the special shield material is to repel heat, to control glare, to distribute light and to prevent anyone from reaching into the fixture.

#### Maintenance and service

- Patient luminaires should be designed to require little maintenance
- Top-quality materials ensure a long service life
- Durable, energy-efficient illuminants cut maintenance costs
- Good service guarantees a good rapport

#### Standards

Derungs luminaires have been developed, produced and certified according to the relevant standards and regulations in the field of medical lighting system to guarantee a maximum of safety:

- CE Marking according to Directive 93/68/EEC
- Medical Device Directive 93/42/EEC
- Low Voltage Directive 73/23/EEC
- Electromagnetic Compatibility Directive 89/336/EEC
- RoHS Directive 2002/95/EEC
- WEEE Directive 2002/96/EEC
- IEC/EN 60598-1: Luminaires: General Requirements and Tests
- IEC/EN 60598-2-25: Luminaires for use in Clinical Areas of Hospitals and Healthcare Buildings
- IEC/EN 60598-2-1: Fixed General Purpose Luminaires
- IEC/EN 60601-1: Medical Electrical Equipment: General Requirement for basic Safety and essential Performance
- IEC/EN 60601-2-41: Particular Requirements for the Safety of Surgical Luminaires and Luminaires for Diagnosis
- ISO 9001



# THANK YOU FOR YOUR ATTENTION

## WE ARE AT YOUR SERVICE AS A RELIABLE PARTNER

Satisfying customers is the driving force behind everything we do. We provide excellent customer service and professional advisory service in addition to a broad range of products. We are committed to ensuring your long-term satisfaction as our customer.

### Our product range

The broad range of our product line answers your every need and covers the entire field of medical lighting systems in our market segment. In addition to our standard product range, we also design specialty fixtures customized to meet the unique needs of our customers. We continuously adapt our product range with innovations in response to market demands.

### Our range of luminaires:

D <sup>med</sup> ®	Treatment / Examination Lights
D <sup>care</sup> ®	Care and Reading Lights
D <sup>lite</sup> ®	Room Lighting

### Our market segments:

Senior care  
Hospital / Clinics / Doctors' surgeries  
Veterinary surgeons / Animal clinics

### Service / Advisory Services

We are at your service as an innovative, flexible and reliable partner. Advisory service and support are an integral part of our service spectrum, complete with professional planning of lighting systems and unique lighting designs. Moreover, we remain at your disposal after the sale with our fast and reliable customer service.

### Your solution

This brochure imparts important knowledge on the professional planning of lighting systems and it provides viable solutions.

Please refer to "Product Overview / Technical Data" for more information on each luminaire.

Should you be interested in other Derungs Licht AG lighting solutions, we will gladly send you the relevant information.





# LIST OF REFERENCES

## COPY, GRAPHIC IMAGES

### Graphic images

The graphic images on page 5 were used with the kind permission of "Allgemeinen Blinden- und Sehbehindertenverein" in Berlin and were taken from their visual impairment simulator ([www.absv.de](http://www.absv.de)).

Original photography: Andreas Friese

Till Roenneberg, Institute for Medical Psychology of Ludwig-Maximilians-Universität in Munich, DE: "Das rhythmische Auge der inneren Uhr" (p. 9)

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Rudolf Welter, Matthias Hürlimann, Katharina Hürlimann-Siebke: "Gestaltung von Betreuungseinrichtungen für Menschen mit Demenzerkrankungen" (pp. 6, 8)

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