

human centric lighting

biodynamic lighting solutions
in care facilities



morning



space, light and calm

The room has a great influence on the patient's well-being and recovery. But it is the light that defines the room, makes it tangible. Space and light are inseparably linked.

Our products merge with the architecture to form a single unit, integrative room and lighting concepts that visually calm the hospital room – with maximum functionality and ergonomics for staff and patients. We create rooms of calm.

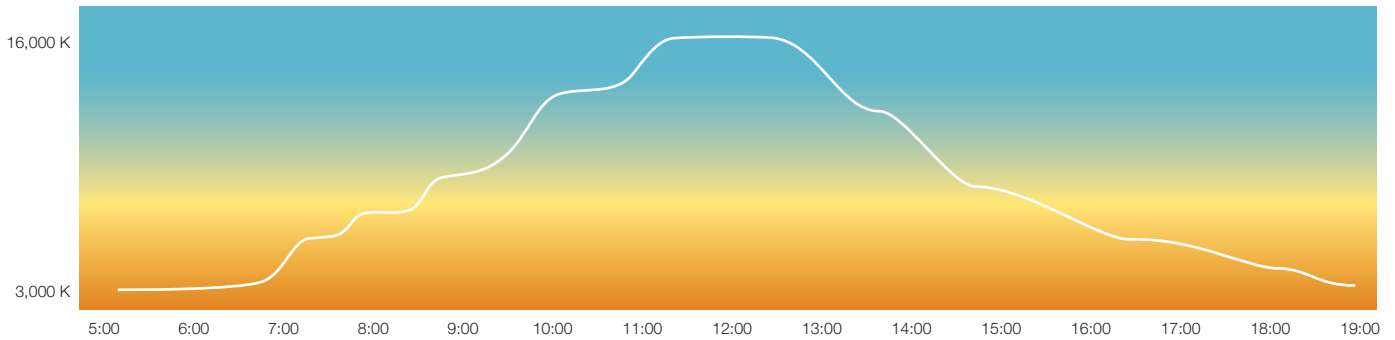
Light has not only a visual effect, but also an emotional and biological one: Human Centric Lighting (HCL) supports human health, well-being and performance. Since the 1980s, U.S. researchers Jeffrey C. Hall, Michael Rosbash and Michael W. Young have been deciphering the mechanisms that control circadian rhythms. In 2017, they were awarded the Nobel Prize in Medicine and Physiology.



evening



HCL lighting is available in many Schyns products



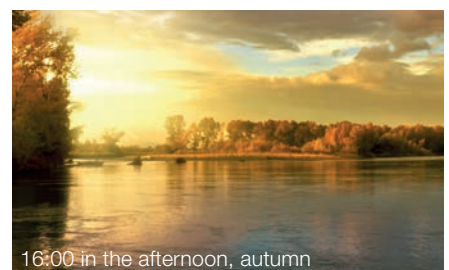
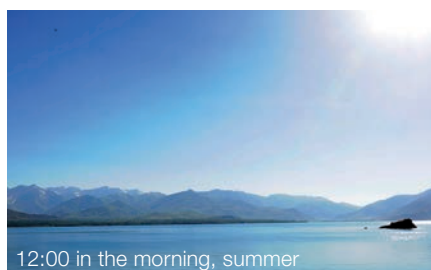
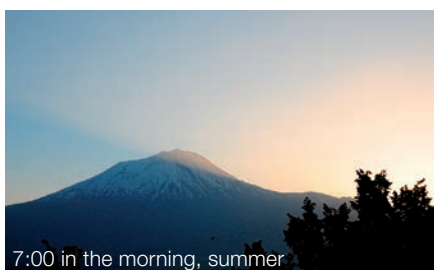
Human Centric Lighting reproduces the natural course of the day in its spectral quality and thus supports hormonal balance.

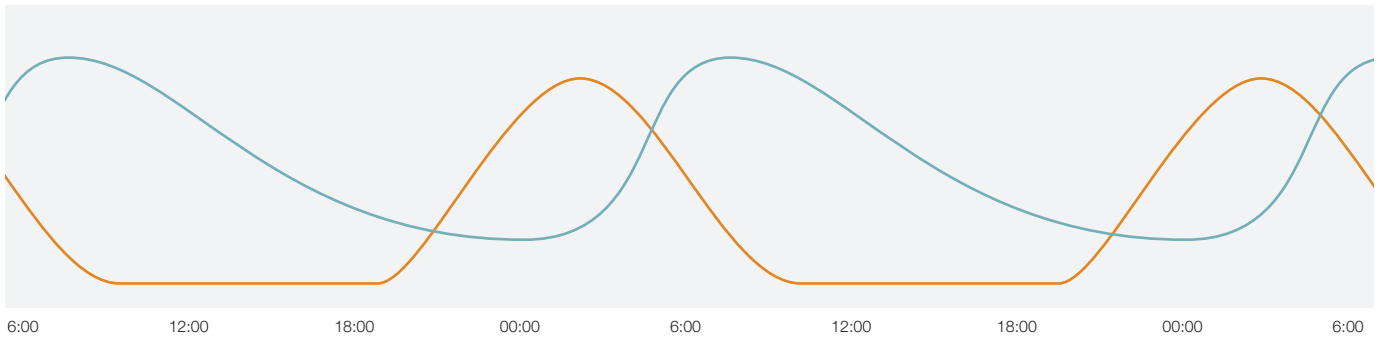
the effect of light

Light has a noticeable effect on human vitality and health. Light from the sun is crucial for health and well-being – but modern people spend most of their lives indoors. To respond to this cultural evolution towards an indoor society, any artificial lighting solution should match the sunlight characteristics as closely as possible.

Numerous studies show that artificial light with constant properties such as light color and light intensity has a negative effect on health, well-being and performance.

In the course of a day, the intensity and spectrum (and thus also the color temperature) of natural light change continuously. The midday sun vitalizes with its invigorating blue hue, while the evening sun calms with a pleasantly warm reddish hue. For humans, their well-being and all associated biological processes, natural daylight is the authoritative reference.





Cortisol and melatonin levels alternate in intensity depending on the time of day and light color, respectively.

— Melatonin Level — Cortisol Level

the melanopic impact factor

The melanopsin-containing photoreceptors in the human eye react particularly strongly to blue light. The range of highest sensitivity is at a wavelength (part of the light spectrum) of 480 nanometers.

color temperature [K]	visual data	melanopic effective factor*
	Luminous flux [lm]	alpha (smell)
1,800	1,650	0.271
2,000	1,945	0.317
2,500	2,495	0.420
2,700	2,400	0.459
3,000	2,300	0.514
3,500	2,195	0.599
4,000	2,130	0.675
4,500	2,085	0.742
5,000	2,055	0.802
5,500	2,040	0.856
6,000	2,025	0.904
6,500	2,015	0.947
7,000	2,010	0.986
8,000	2,000	1.051
9,000	1,995	1.105
10,000	1,990	1.149
12,000	1,970	1.218
14,000	1,950	1.266
16,000	1,935	1.304



Increased melatonin secretion

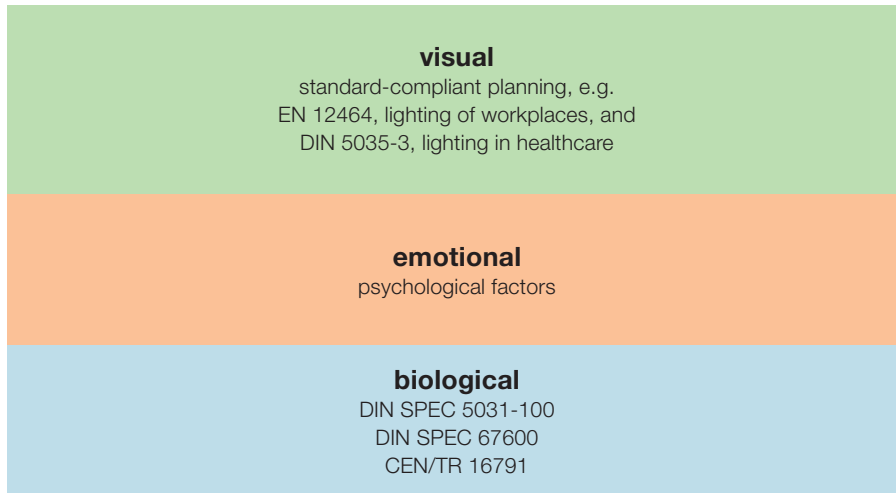
Melatonin makes you tired, slows down the body's functions and reduces activity in favor of a good night's sleep. It also ensures that many metabolic processes are reduced. The body temperature drops, the organism runs on the back burner, so to speak. During this phase, the body secretes growth hormones, which repave the cells at night. The immune system is stimulated.

Reduced melatonin release

Cortisol makes people fit, body functions are boosted. Patients are more active. The internal clock is synchronized.

* Measure of the circadian effect of a light source based on the melanopic light effect (formula is described in DIN SPEC 5031-100:2014)

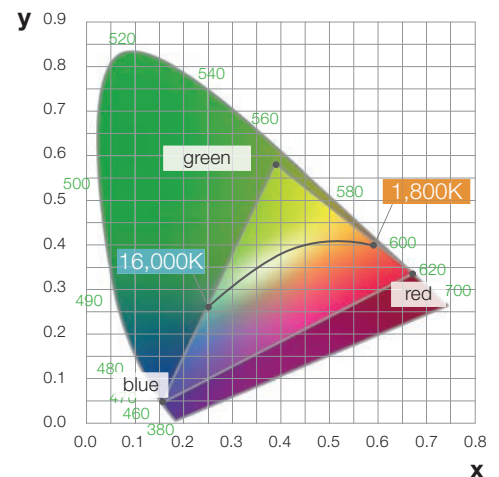
Light acts on several levels



Light has a visual, emotional and biological effect. If HCL is used, the quality of light in the room is improved in many ways. HCL systems are already being used in care facilities.

patented Schyns HCL technology

- color temperature along the Planckian curve
- color temperature 1,800 K to 16,000 K
- individual control of all RGB colors within the color space
- wide spectrum with color rendering CRI 90 or higher
- constantly high energy efficiency from warm white to cool white
- 100% calibrated and temperature compensated for lowest colour tolerances (MacAdams Step 1)
- mint green night illumination possible (ideal, as no light penetrates the eyelid and thus the patient is not disturbed)
- No Flickering according to IEEE 1789-20158
- Phosphor Couchumed Red LED
- examination light 4,000 K, with automatic return to HCL daylight course after the examination
- emergency light 6,500 K
- amber light for calming, e.g. before operations or shortly before going to bed
- integration of a cleaning light scene for better hygiene results



working range of the HCL system with
Planckian curve

Numerous studies prove the positive effects of high-quality lighting solutions:

- „Light can alleviate winter depression“ (Lewy, 1982).
- „Light can regulate the sleep-wake rhythm of Alzheimer’s patients“ (van Someren, 1997)
- „Light can improve weight gain in premature infants“ (Miller, 1995; Brandon, 2002)
- „Light regulates melatonin production“ (Lewy, 1980)
- „Melatonin reduces the growth of breast cancer“ (Dauchy, 1999; Blask, 1999)

Illumination properties

	critereon / property of lighting	Schyns HCL	WW	TW
visual	High color rendition CRI > 90	●	○	○
	High efficiency up to approx. 140 lm/W	●	●	○
	Max. color consistency thanks to 100% calibration	●	○	—
	Color temperature range 1,800 - 16,000 K on the Planckian curve	●	—	—
emotional	Individual lighting scenes and light colors off the Planckian curve	●	—	—
biological	Individually adjustable blue content	●	—	—
	Span of the melanopic active factor	0.2 to >1	0.3 - 0.4	0.3 - 0.8

Comparison between classic warm white static lighting (WW), Tunable White lighting (TW) and Schyns HCL.

● yes ○ possible — no

advantages in nursing

From the patient's perspective

- sleep and wake phases can improve
- positive influence on biological processes in the human body
- positive effect on the well-being of the patient
- treatments can be more effective
- immune system is stimulated
- calming amber lighting

From the staff's perspective

- therapy time can decrease
- need for care can decrease
- risk of delirium is reduced in the patient
- skin changes better recognisable in the patient due to high CRI or F13 and F15 value (F13 skin colour European, F15 skin colour Asian)
- better concentration

From the operator's perspective

- more satisfied patients
- better hygiene through cleaning routine
- staff sickness rates can be reduced
- increased staff performance
- advertising effect towards other houses
- future-proof and modern lighting





light design and control

A well-designed HCL system is based on nature. Since natural daylight often consists of two components (sun and sky), we always recommend two light sources for an atmospheric and pleasant lighting architecture. The medical supply unit recreates the sky with indirect general lighting. The downlights that shine vertically imitate sunlight with a warmer light colour and create a natural interplay of light and shadow on the wall. This gives the rooms a harmonious atmosphere. The room and lighting concept creates a calming and homely environment.

Daylight changes the light colour, illuminance and light direction during the course of the day. An electronic, autonomous lighting control system provides the desired dynamic lighting solution depending on the time of day.



At the touch of a button, the course of daylight is interrupted and the normatively required examination lighting in neutral white 4,000 K is switched on. Optionally with time-controlled, automatic return to the HCL daylight sequence. In the Premium version, an additional 1,000 lux of examination lighting is possible.



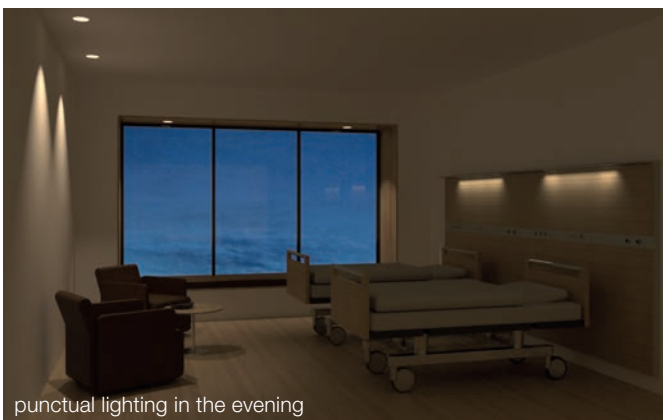
The amber-coloured illumination with 1,800 K can be switched on if necessary, e.g. before operations or for calming. This light colour also prepares the patient for falling asleep in the evening.



light controls

At this point, we provide complete service from a single source. All the necessary control components are pre-installed in the medical supply units ready for connection and prepared, for example, for control by the nurse call or external switches.

HCL daylight sequences and individual lighting scenes, such as emergency lighting, can be easily implemented to suit the care facility. Whether classic switch in the medical supply unit or touch display: all systems are from a single source and are delivered coordinated with each other.



punctual lighting in the evening

In the evening, the punctual wall lighting gives patients the freedom to individually adapt the appearance of the room light to their needs and create a homely atmosphere.



mint green night lighting

The continuous mint green night lighting offers the nursing staff the possibility of monitoring the patient without waking him up. The mint green light does not penetrate the closed eyelids.



customised planning

Lighting solutions adapted to human biological rhythms are as individual as people themselves. Comprehensive consultation and a customised, professionally planned lighting concept form the basis for optimally coordinating the dynamic lighting parameters and finally exploiting all the advantages of HCL lighting.

When selecting products, a feeling for the architecture and its aesthetics is very important to us. If the project requires it, we are also able to work out special solutions with you and the client. In general, it is possible to integrate HCL technology into all Schyns products. We will be happy to advise you on site. Detailed advice prevents planning errors and makes the use of the technology easy. We also offer planning training courses.

An important quality feature in luminaire construction is the absence of flicker to avoid stroboscopic effects. Schyns products are characterised by precisely this property.



Since a coherent room concept is very important to us, we can offer other luminaires with our HCL technology. This way we ensure that the components are coordinated with each other. We are happy to create entire room lighting concepts for you. We can also offer luminous ceilings in the lounge area of dementia wards in various sizes.

We take quality management at its word (certified according to EN ISO 13485:2016 and EU Directive 93/42/EEC for medical products) and understand it to mean planning creativity, exemplary customer care and challenging task solving. With us, planning, production and logistics are all in one hand. This enables us to respond flexibly and quickly to even the most specific customer requirements. The basis for the development, production and testing of our medical supply units are all relevant standards (e.g. EN 60601-1, EN ISO 11197 etc.).



Examples of other luminaires from our range

