

# The great effect of light

Human Centric Lighting











The great effect of light  
– open your eyes to Glamox HCL

# Light has a great effect on us humans

Glamox HCL can improve how you sleep, feel and perform.

All living beings have an 'inner clock' called circadian rhythm, and humans are no exception. In short, it means we rise with the sun and go to sleep when it sets. Right light at the right time can influence everything from our sleep to how we feel and perform. That is why human centric lighting (HCL) is beneficial for schools, health facilities and industrial buildings.

Glamox have extensive experience in tailoring HCL solutions and more than 70 reference projects. Contact us to learn more about how to achieve an optimal lighting system for your facility.

Glamox HCL solutions are WELL Building standard™ compliant.



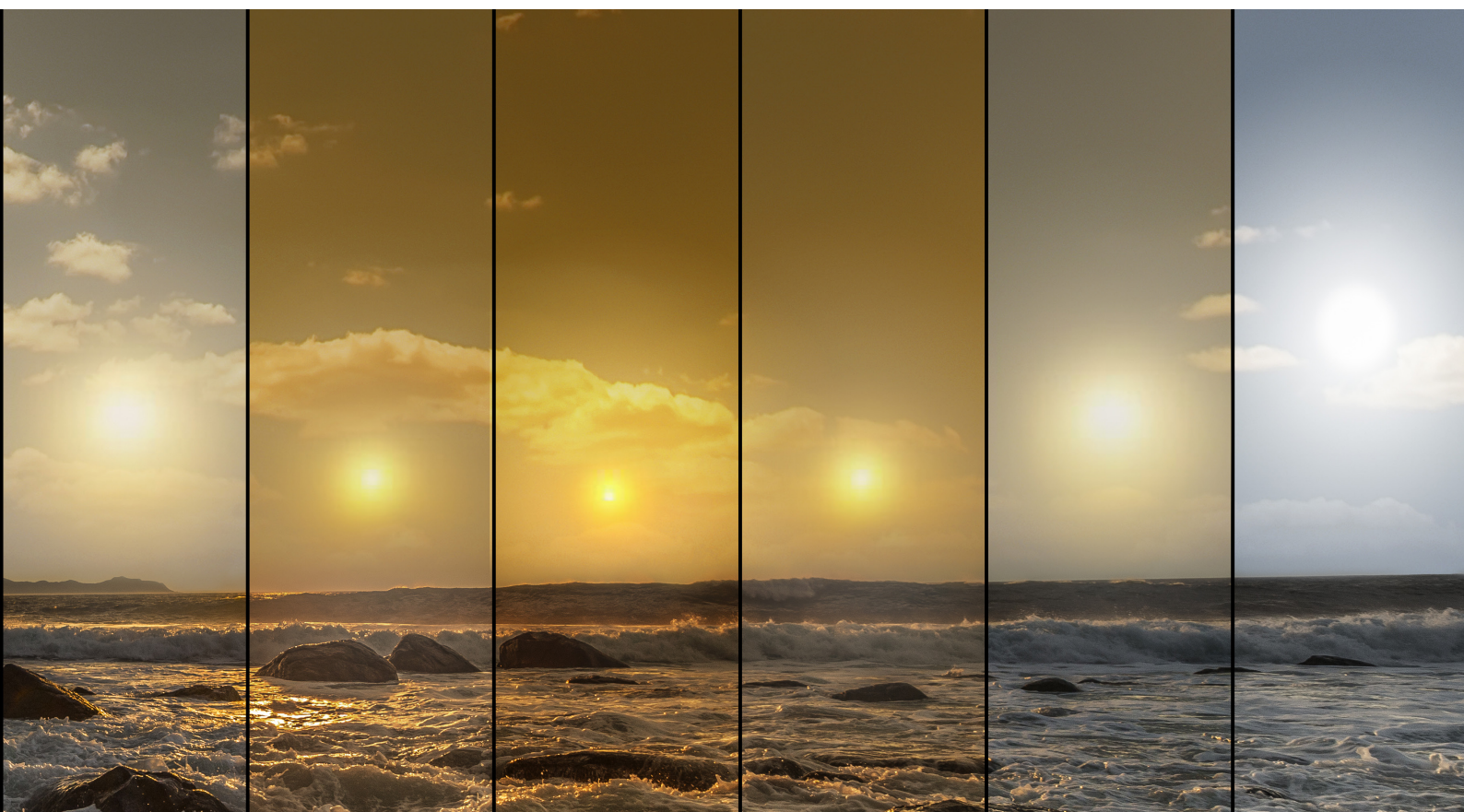


# What is human centric lighting?

HCL is a way of bringing the natural changes of light intensity and colour temperature indoors by using artificial light in order to imitate natural light.







# How can HCL be used?

HCL puts humans in the centre when developing lighting systems, providing optimized work and living environments.

## Biological Lighting

Solutions that mimic the qualities of daylight to enhance human performance, wellbeing and to support a favorable circadian rhythm.

## Ergonomic lighting

Solutions in which lighting technology is used to produce light of different colours in order to create ideal visual working conditions.

## Therapeutic lighting

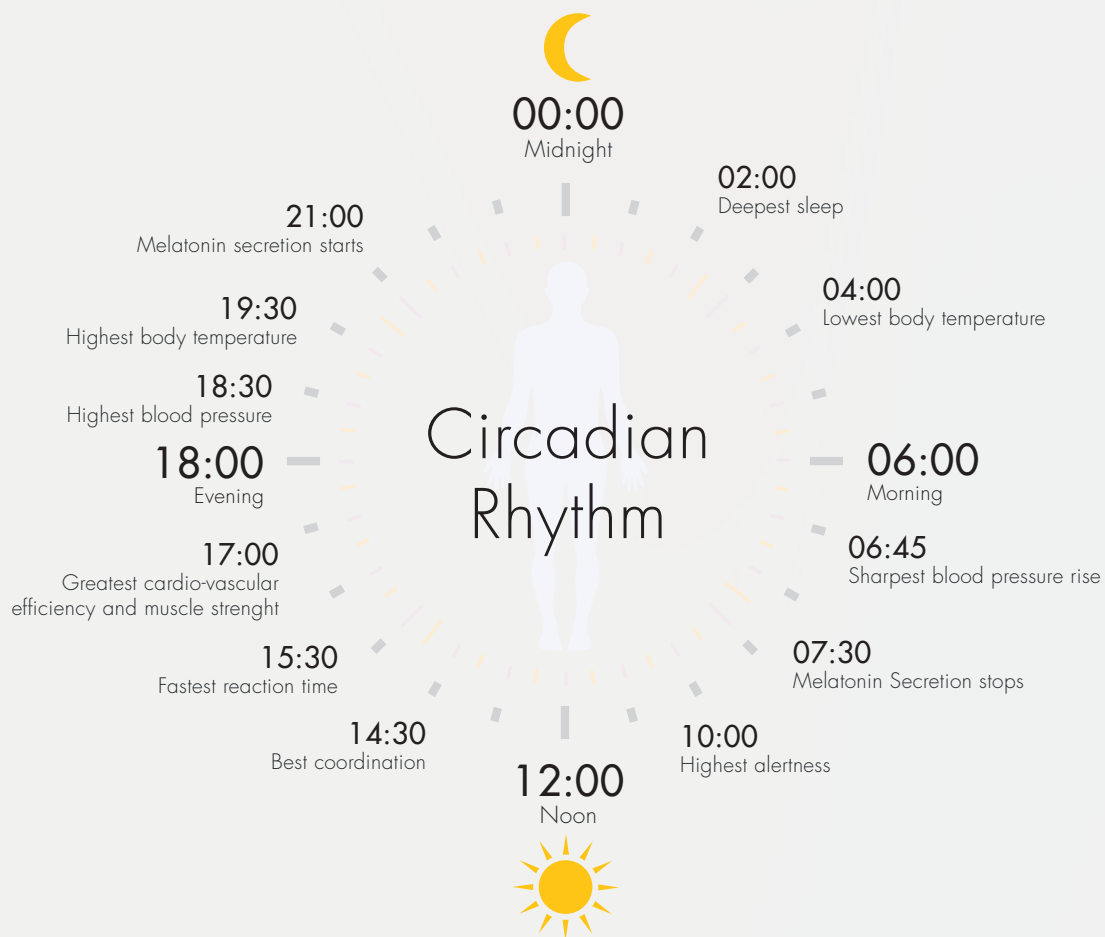
Solutions that can play a part in the treatment and well-being of patients suffering from psychiatric diagnoses or dementia.





# Light has a great effect on us humans

Daylight stimulates us, and influences our moods and activity level. As we spend much time indoors, the characteristics of artificial light becomes significant. HCL solutions can compensate for the lack of daylight and contribute to the natural circadian rhythm of humans.





## Why install a human centric lighting solution?

Humans are affected by light not only on a visual level, but also on a biological one. When installing an HCL solution, you reinforce your circadian rhythm, enhancing your cognitive skills and sense of well-being. It is also used to provide ideal visual working conditions in challenging environments.





## You sleep better

Glamox HCL can improve your sleep quality by adjusting the hormone balance in your body. This is something everyone can benefit from, but it is especially important for vulnerable groups like adolescents, shift workers, psychiatric patients and people with dementia.



## You perform better

Glamox HCL can improve performance by enhancing the ability to concentrate, increasing alertness and reducing fatigue, which in turn can lessen the number of errors made at work.



## You feel better

Users of HCL solutions report that they feel healthier, happier and more energetic. This is because human centric lighting stimulates the natural circadian rhythm, and hence increases your well-being.

# How to implement Glamox HCL

When installing human centric lighting, there are four parameters that require close attention: spectrum, intensity, timing and duration and distribution. Every building and environment has its own unique challenges that need to be addressed accordingly. To optimize the effect of human centric lighting, the solution needs to be tailored to your specific needs.



## Spectrum

We know that the blue wavelengths in light are the biologically active parts. For this reason, we use cool white light sources with wavelengths in the blue spectrum to stimulate the body in the morning and as a boost when high concentration and alertness is needed. In the evening, warm white light can aid relaxation and rest.



## Intensity

Research has taught us how much light is needed to influence the biological processes in the human body. We need to choose solutions that provide enough light to achieve this, while taking care of issues such as unwanted glare and energy consumption.





## Timing and duration

Light in the morning is the most effective. It tells our biological clock that the day has begun and that bodily functions need to be activated. Conversely, light exposure in the evening will cause melatonin production to be suppressed and make it harder to fall asleep. It is important that we take these factors into consideration when planning a human centric lighting solution with a 24 hour cycle.



## Distribution

For light to have a biological effect, our eyes need to be able to perceive bright areas in the room as effectively as possible. Because the receptors that affect our circadian rhythm are particularly sensitive in the lower and nasal part of the eye, illumination of surfaces in the upper part of the field of view is recommended. We have designed a method of calculating the biological effect based on spectrum, intensity and distribution.





# Efficient and cost-effective Light Management Systems

A human centric lighting solution requires a sophisticated light management system to set and adjust the time cycle for the intensity and colour temperature of the light. Glamox offers light management systems of different levels of complexity and will help you tailor a solution that is both functional and user friendly.

Although there is no 'one-size-fits-all' solution, we have developed some general designs for use in different environments such as healthcare facilities, schools, offices and industry. This makes for efficient and cost effective implementation of human centric lighting.

Our experts will help and guide you through every step of the way to ensure the perfect solution for your needs. Read more about Glamox Light Management Systems on our website.

You define. We connect.





## Applications for Glamox HCL

Human centric lighting has a wide variety of applications, but every solution needs to be tailored to the specific needs of the client. We have more than 70 reference projects of lighting solutions we have developed for schools, healthcare facilities, offices and industrial buildings.





## Schools

### Improved concentration

Schools can benefit from human centric lighting in several ways. Not only can this type of lighting be used to stimulate the circadian rhythms of pupils and staff, but also to improve alertness during tests and concentration tasks. With biologically optimized lighting systems in educational environments, natural lighting conditions can be achieved more effectively.







## Offices

### Improve your workday

Humans spend most of their time awake indoors, especially during winter time. That makes office areas excellent places to implement human-centric lighting solutions. Reports from workplaces and offices tell of a boost in both energy and motivation after installing a human centric lighting solution, as well as an increase in the overall wellbeing of employees. Glamox HCL solutions are WELL standard compliant.





## Health Care

### Improved healthcare

Healthcare environments are well suited for implementing lighting cycles with sunrise, sunset and daylight simulations, as residents are often permanently based in these facilities. The effects on patients or residents can include higher activity levels during the daytime, better sleep at night and shorter recovery times. The use of coloured light can be beneficial for surgeons who rely on monitors during surgery. Dynamic blue or green light in the field of view is used to enhance contrasts on the monitors. This in turn reduces the eye strain for surgeons.



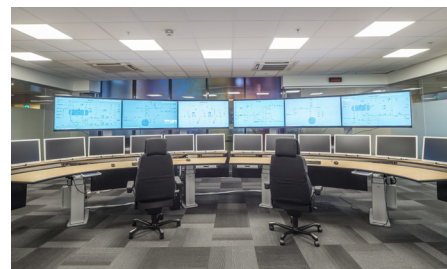
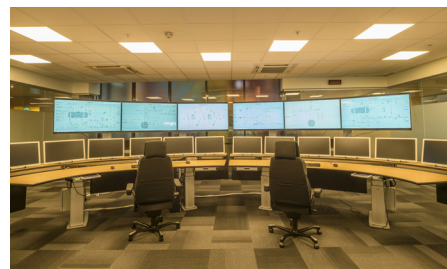




## Industry

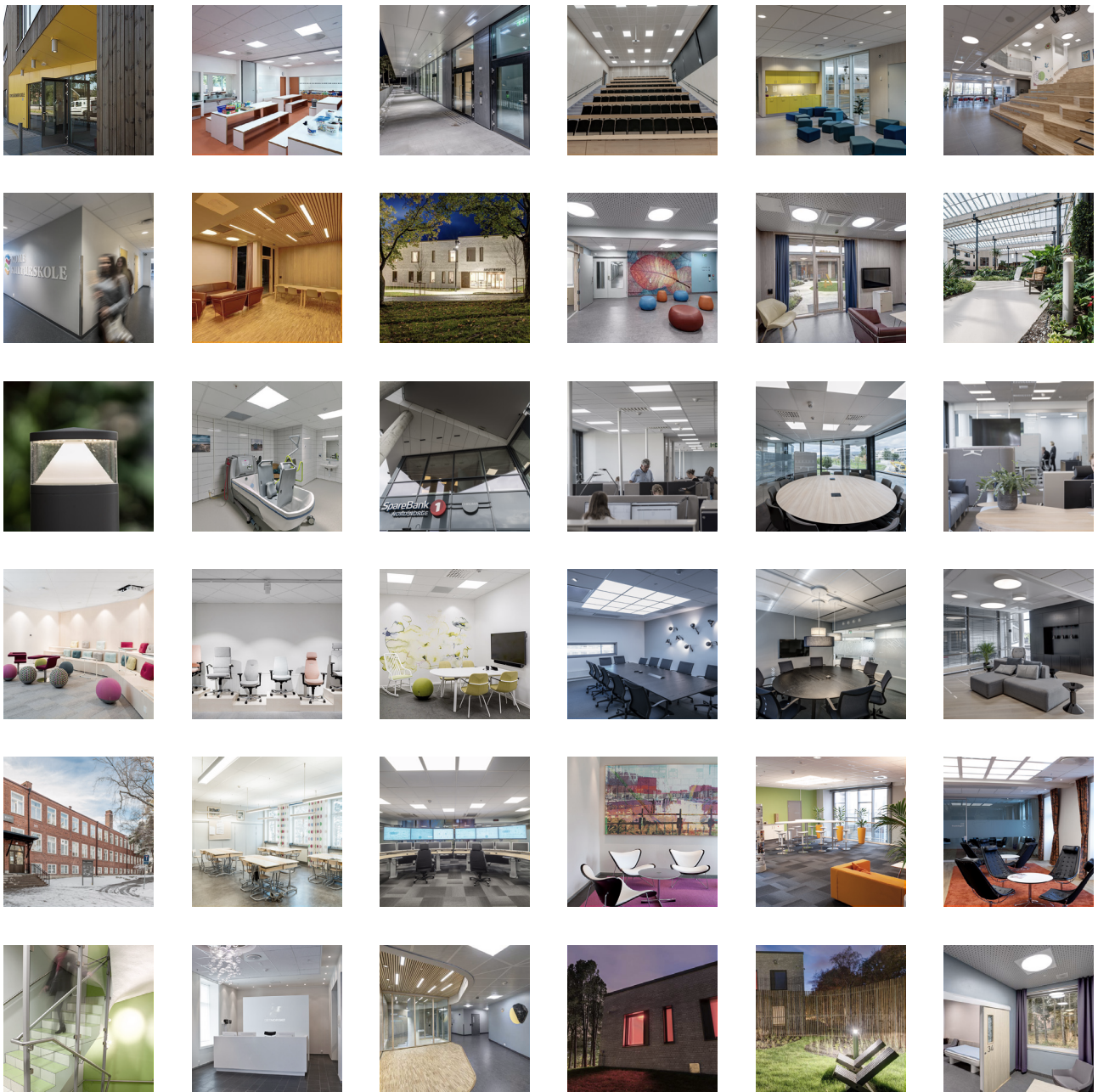
### Improved performance

Lighting installations with higher intensity and tuneable white light may increase production output and reduce fatigue, errors and accidents.



More than 70 reference projects

Glamox has been working with Human Centric Lighting since 2013 and today we are a leading supplier of HCL solutions with numerous delivered projects. Find more information and inspiration on our website.





# Research based knowledge

Human centric lighting is a field of research in rapid development, and Glamox seeks to increase its insight accordingly.

Glamox HCL solutions are based on the latest research and standards available.

Glamox is collaborating with a number of external research institutions, and supports and contributes to a number of studies.





# The Glamox Group

Glamox is a Norwegian industrial group that develops, manufactures and distributes professional lighting solutions for the global market.

## Quality brands and solutions

The Group owns a range of quality lighting brands including Glamox, Aqua Signal, Luxo, Norselight, LINKSrechts, Küttel, Luxonic and ES-System. Glamox is committed to meeting customer needs and expectations by providing quality products and solutions, service and support.

## Technology and expertise

Our products and solutions are developed and tested by our engineers at our own research and testing facilities, and manufactured and certified in accordance with all relevant quality and environmental standards. They are based on the latest technology and expertise – and generations of experience.

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Please refer to our website  
for information about  
our 5 year warranty.