

Dynamic Lighting



## DYNAMIC LIGHTING IN HEALTH-CARE FACILITIES

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*The effects of natural lighting in health-care facilities*

## The effect of Dynamic Lighting

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TLV products equipped with Dynamic Lighting combine two innovative technologies. By equipping a system with LED sources, energy efficiency can be improved and therefore the overall consumption of the system can be reduced, whilst the effects of natural lighting from sunrise to sunset are simulated by artificial intelligence.

This means that the lighting automatically adjusts its colour temperature and its brightness throughout the day and without requiring any intervention.

Dynamic Lighting creates a natural and stimulating light environment inside buildings. It boosts human feelings of well-being. It can also be adapted to the needs of its users.

In a hospital setting, Dynamic Lighting can be a means to improve the comfort of patients and care personnel.

### ■ Advantages and benefits for patients and care teams

- Improves the patient environment
- More pleasant wake cycle
- Stimulating light during the daytime
- A feeling of well-being thanks to light that is closer to natural light
- Helps resynchronise the circadian rhythm
- Positive effect on mood and feelings of well-being
- Promotes concentration in care teams

### ■ TLV products available with Dynamic Lighting

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Products	Dynamic Lighting
FLUIDYS	●
MEDISSIMA	●
HI-BEAM	●
MEDIVA	●
COCOON	
LUMIA	●
LYSA	●
GOODLIGHT	●
LINA	●
ILUS	●
SKYDECO	●

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## APPLICATIONS IN A HOSPITAL ENVIRONMENT

Dynamic Lighting can be used in normal care rooms, OT/ICU Resuscitation areas, and passageways.

### ■ Normal care rooms

One of the essential functions of the system is to use light to restore a temporal reference to people whose circadian rhythm has been upset.

### ■ OT/ICU resuscitation areas and passageways in health-care facilities

Surgery times in the operating theatre, lack of exposure to natural light, examination cubicles where patient privacy must be protected: all of these situations require medical personnel to work in artificial lighting, cut off from any temporal reference. Dynamic Lighting can compensate for this.

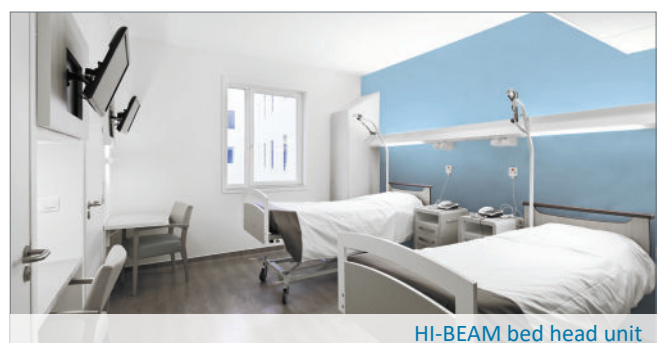
### ■ Retirement homes and nursing homes

Chronobiological changes in the elderly can result in a phase shift in the sleepwake cycle, leading to an earlier bedtime and earlier rising compared to socio-cultural norms.

To remedy this problem, the Dynamic Lighting option synchronized to the (24-hour) circadian cycle allows residents to resynchronize their biological rhythm and avoid a significant offset of their day/night cycles. This makes the sleep-wake cycles more pleasant, because the lighting adapts gradually.

### ■ Alzheimer Units

Alzheimer patients can be subject to changes in their circadian rhythm, and sometimes their sleepwake cycle becomes disrupted. Dynamic Lighting contributes to resynchronising the internal biological clock.



## OPERATION

Thanks to its embedded electronics, the TLV Dynamic Lighting system is just as easy to use as a standard product.

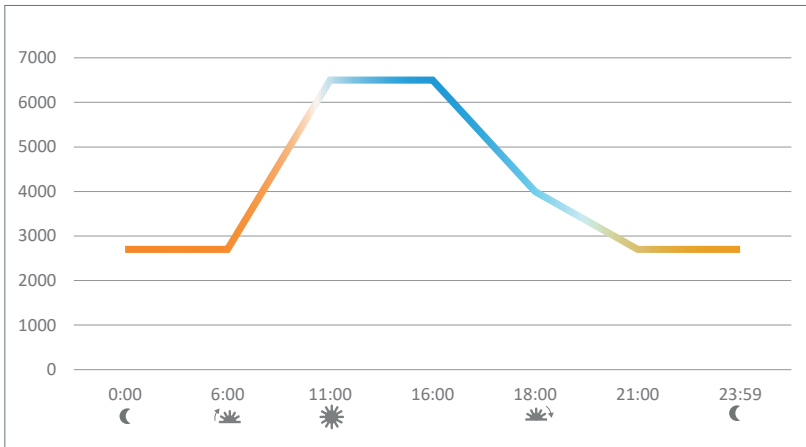
When it is switched on, the colour temperature is automatically adjusted according to the location, the time, and the position of the sun. The colour temperature is then adjusted throughout the day.

In parallel, the artificial lighting can be adjusted (optionally) according to the natural light available. This saves energy.

For areas without natural light, it is possible to vary the brightness according to the time of day. In this operating mode, the behaviour of the product tends to reproduce a circadian cycle, for a gentler awakening phase and a more pleasant end to the day.

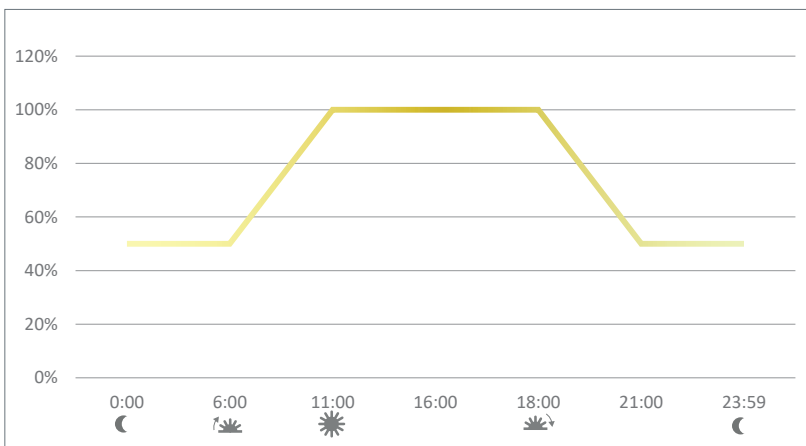
The caring lighting control can be used at any time to switch the Dynamic Lighting to 100% intensity with a neutral tone. This care mode, combined with the reading lighting, provides high-performance lighting in accordance with AFE\* recommendations.

### ■ Variation in colour temperature and intensity over a 24-hour cycle.



The curve adjusts automatically according to location and season.

- The brightness control can be synchronised:
  - To the colour temperature variation curve.
  - With an optional brightness sensor, for the light intensity to adapt automatically to the natural light available.



The curve adjusts spontaneously according to the location and seasons or the automatic light-up and lights-out time, depending on the requirements of the department. This means that patients can be woken up with a warm tone just before breakfast.

\* AFE : French Lighting Association

# LIGHT: AN ESSENTIAL ELEMENT OF OUR DAILY LIVES

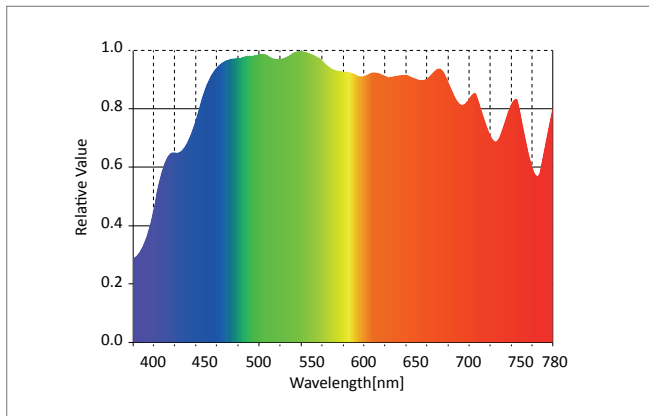
TLV's Dynamic Lighting technology provides health-care facilities with a quality of light much closer to that of natural light—an essential element for our biological rhythms.

The effects of natural light in our daily lives are partly thanks to the spectrum that makes up this light. Until now, the use of fluorescent light sources did not allow us to properly reproduce the spectrum of daylight, whose wavelengths are continuous and fall between 380 and 780 nm.

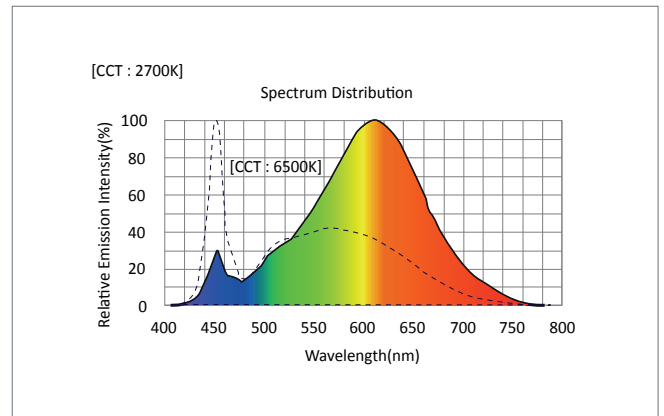
Thanks to the use of TLV technology, which combines the use of high-performance LEDs with embedded artificial intelligence, the light emitted is far more similar to the spectrum of sunlight. The characteristic rays of fluorescent sources are gone, and are replaced by a more complete, more natural, and therefore more pleasant spectrum.

To do this, TLV uses two light spectra: a 2700K spectrum and a 6500K spectrum. These are mixed appropriately according to the time of day, to obtain the most natural lighting possible. The warm light spectrum provides significant red content, like the light at sunrise and sunset. The cold light spectrum provides significant blue content, which is invigorating.

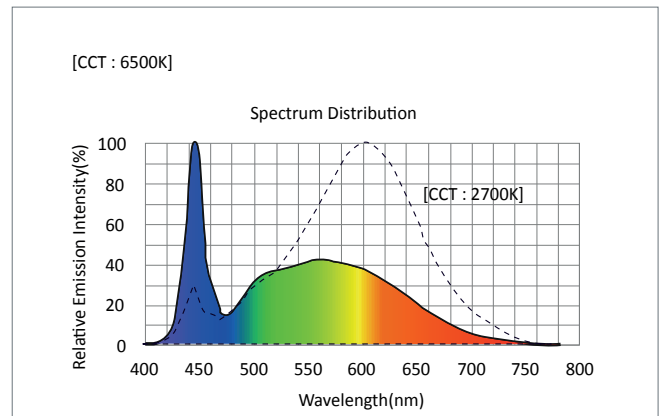
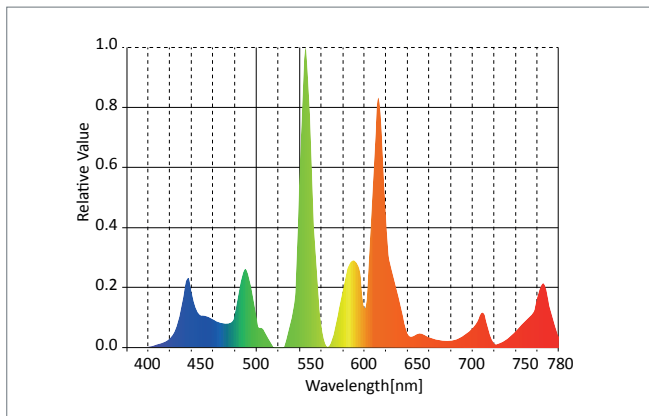
## ■ Natural light



## ■ TLV artificial tunable white light



## ■ Fluorescent artificial light



Bed head units, wall lighting units, ceiling pendants, suspended columns and beams,  
medical supply units, sealed lighting units, medical gas monitoring and biomedical accessories

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