

# Circada Dynamic Lighting

**The ideas that underlay the development of Virtual Daylight®, were that human biology had evolved to function best in daylight. A simple idea, but one much ignored by the lighting industry at the time.**

## Biology and Daylight

10 years on, we understand much more about the biological mechanisms involved. The discovery in 2001 of photosensitive cells within the ganglion layer of the retina provided a key missing link. Subsequent study showed the bias of these photoreceptors towards short wavelength (blue) light. These cells were found to exert primary influence on the suppression of the hormone melatonin secretion from the pituitary gland.

## Circadian Rhythms

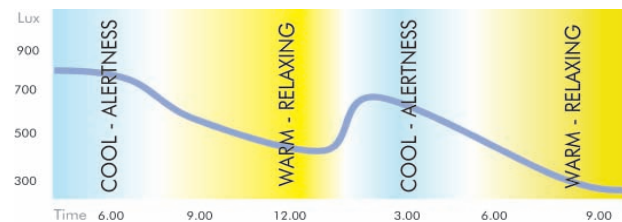


Melatonin is the hormone that most effects the human circadian (daily) rhythm, which in turn has an effect on the functioning of the major organs of the body. Levels of brain function, heart rate, blood pressure and temperature, digestion and sleep all adhere to a natural rhythm, which follows the rise and fall of the sun. A healthy circadian rhythm is a key ingredient to human well-being.

## The Workplace

In an outside or daylit (Daylight Factor > 5%) workplace natural light will provide the levels required to entrain a healthy circadian rhythm. However these levels of daylight

are unusual. Lower levels of natural daylight within the workplace may create problems for workers, particular those spending long hours at their workstations during the winter.



Circadian Dynamic Lighting Example

## Dynamic Lighting

Dynamic lighting is light that changes in colour hue and intensity to reproduce characteristics of natural light across the day. The system uses different colour temperature white lamps linked to control system and automating software. The lighting shifts imperceptibly across a cool to warm spectrum to mimic the changes in light that occur as the sun moves across the sky.

Dynamic lighting has been used to enhance the alertness of shift workers at night. However, although this has been found to be effective, more study on the possible effects of this practice is needed.

## Circada

Circada is Clearvision's system of dynamic lighting, based either on a single fitting with two different lamp colours (4,000K & 8,000K being typical) and software to create a daylight sequence. It is ideal if the fittings mix the colour well (see SKY2 for example) with high levels of diffusion to disguise the light source. It is preferable if the design and location of the fitting in some way suggests natural daylight.