



The Benefits of Blue LED Light

Blue light plays an important part of our every day life. There are a number of beneficial elements to the colour blue that can enhance our well being, and improve our quality of life dramatically. If used inconsiderately, however, the wrong type of blue light can upset many things, including sleep patterns. For example, working late with a computer set to a bright cool white setting, which includes a greater proportion of the wrong blue frequencies, will cause an inability to sleep soundly.

SLEEP

New research reveals hidden receptors in the human eye that respond to blue light. These receptors trigger the perception of day / night rhythms and control sleep patterns, which affect stress and general well being.

Pure blue light is 50 times more effective than full spectrum white light in overcoming Seasonal Affect Disorder SAD.

Research also reveals that Yellow light has the opposite effect and can mute the blue benefits. By controlling the proportions of blue and yellow light throughout the day, colour can 'speak' directly to the brain subconsciously, reduce stress by controlling sleep patterns and provide a general feeling of well being to both patients and shift workers alike.



BACTERIA

New research has shown that the lower frequency blue light can kill acne bacteria (*acne vulgaris*)¹ together with four major bacteria implicated in gingivitis and periodontal disease².

Researchers collected oral cultures containing as many as 600 different bacteria from 15 patients who were suffering from chronic periodontitis but had not undergone any treatment for the condition in the past three months. The effects of the blue light treatment were measured on *Porphyromonas gingivalis* (*P. gingivalis*), *Prevotella intermedia* (*P. intermedia*), *Prevotella nigrescens* (*P. nigrescens*) and *Prevotella melaninogenica* (*P. melaninogenica*).² Reference: Journal of Antimicrobial Agents and Chemotherapy, April 2006

LIGHT RESEARCH

Because sunlight is a broad mix of colours, the human eye perceives it as white. Lamps used in past attempts to adjust people's internal clocks have emitted a broad composite of colours that also appeared white.

However, suspecting that the biological clock preferentially responds to select elements of the spectrum, George C. Brainard and his team at Thomas Jefferson University in Philadelphia launched a 5-year effort to find the most-effective hues. The project tested 72 people and encompassed more than 600 person-nights of observation.

Results, published 5 years ago, showed that the biological clock is most responsive to a narrow band of wavelengths from 466 to 477 nanometres (nm), which are close to the blue of a clear sky.

Brainard's team has also investigated blue-light therapy. The researchers tested 24 people with winter depression, also known as seasonal-affective disorder (SAD). Half were given light boxes lit by red LEDs, and the rest had boxes lit by blue LEDs. Early every morning for a month in winter, each volunteer sat directly in front of one of the light boxes for 45 minutes.

Longwood Business Park :: Fordbridge Road, Sunbury-on-Thames :: Middlesex UK TW16 6AZ
T: +44 (0)845 094 6010 :: F: +44 (0)845 094 6020 :: www.ecoledlighting.com :: info@ecoledlighting.com

Registered in England & Wales :: EcoLEDLighting Limited
Registered Office: Euro House, 1394 High Road, London N20 9YZ :: Company Reg No: 02322246


EcoLEDLighting




In the March 15, 2006 *Biological Psychiatry*, the scientists reported that people who got blue-light treatment experienced almost a 60 percent reduction in SAD symptoms compared with a 40 percent reduction in people receiving red light. Moreover, the blue light's intensity, 400 lux, which is comparable to the light reflected from a well-lit desktop, yielded symptom reductions comparable to those seen in other studies using glaring, 10,000-lux white light. Reference: Brainard, G.C., et al. 2001. Action spectrum for melatonin regulation in humans: Evidence for a novel circadian photoreceptor. *Journal of Neuroscience* 21(Aug. 15):6405-6412

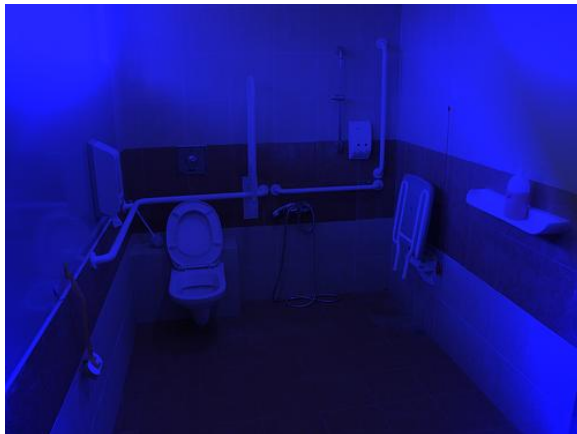
Which Colour Blue?

EcoLEDLighting supply two types of Blue LED devices: Sky Blue and Royal Blue.

 Sky Blue is not as deep as the Royal Blue but is more efficient and hits the eyes response curve more effectively (see chart). It is this slightly longer wavelength that also exactly matches the recently discovered blue receptors affecting the sense of daylight, and has the ability to overcome Seasonal Affective Disorder (SAD) if used correctly.

 Royal Blue has a shorter wavelength but due to the eyes poor response in this region, it is not seen as a strong light source. However, Royal Blue LEDs do have a huge advantage: The Royal Blue LED is largely outside of the frequency of the blue receptors, so it does not affect SAD rhythms. This means that it can be recommended for all night time applications so as not to affect sleep patterns. A good application of using Royal Blue is where people will be moving from a Royal Blue lit area, such as a bathroom, back into a dimly lit bedroom. Moreover, the light produced is generally more aesthetically pleasing to the human eye.

EcoLEDLighting and Blue LEDs



EcoLEDLighting recommends using Sky Blue LED lamps to overcome SAD at the appropriate times of the day and to use Royal Blue LEDs at night to illuminate areas but not to disrupt sleep patterns.

Another benefit of the Royal Blue Light is that the eye tends to view this colour as a giving a floating type of effect, which is why many designers tend to place these lamps under chairs and around bars, to enhance the uplifting, relaxed atmosphere they wish to create.

EcoLEDLighting has released both Sky Blue and Royal Blue LED downlighters.

The following chart shows that the Blue LEDs used by EcoLEDLighting are a 95% match to the frequency that human biological clocks work in.

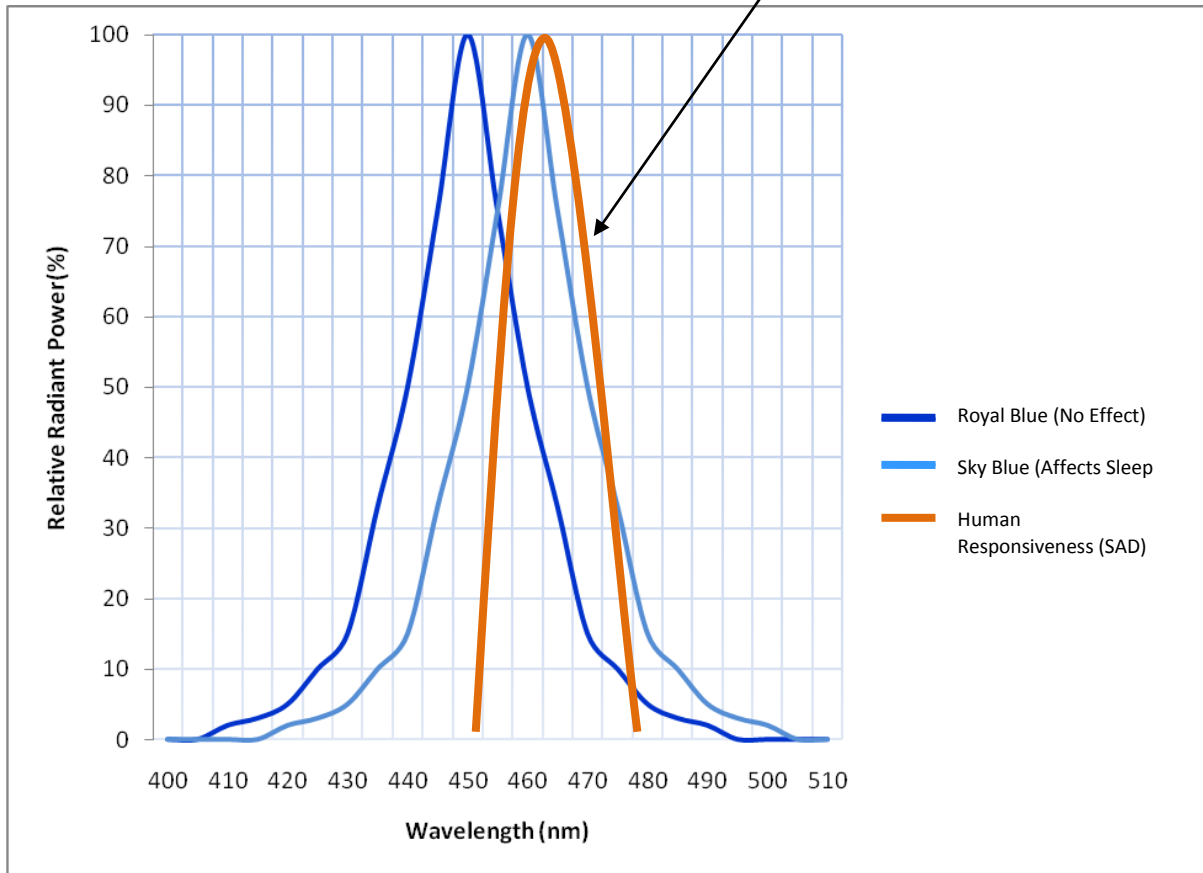
Longwood Business Park :: Fordbridge Road, Sunbury-on-Thames :: Middlesex UK TW16 6AZ
T: +44 (0)845 094 6010 :: F: +44 (0)845 094 6020 :: www.ecoledlighting.com :: info@ecoledlighting.com

Registered in England & Wales :: EcoLEDLighting Limited
Registered Office: Euro House, 1394 High Road, London N20 9YZ :: Company Reg No: 02322246



Blue LED Spectral Output

Biological clocks most responsive to this wavelength



More information about EcoLEDLighting can be found at www.ecoledlighting.com

Longwood Business Park :: Fordbridge Road, Sunbury-on-Thames :: Middlesex UK TW16 6AZ
T: +44 (0)845 094 6010 :: F: +44 (0)845 094 6020 :: www.ecoledlighting.com :: info@ecoledlighting.com

Registered in England & Wales :: EcoLEDLighting Limited
Registered Office: Euro House, 1394 High Road, London N20 9YZ :: Company Reg No: 02322246