

**Easy on your eyes!**  
The secret is our blue-light-cut LED technology



**JAPAN PREMIUM**

**Reach**  
Series

**PRIMESTAR CO.,LTD**

A new industry standard – the LED that protects your eyes

Japanese the most high-performance LED lighting

# Reach Series



Actual use in Japan of hospital NO.1

A: International noise standards  
Committee on Radio Interference  
CISPR11 / 15/22 compatible

B: “MCPET” insert

\* Blue light reduction

\* Up illuminance

\* Spread the light

C: Circadian Rhythm Lighting



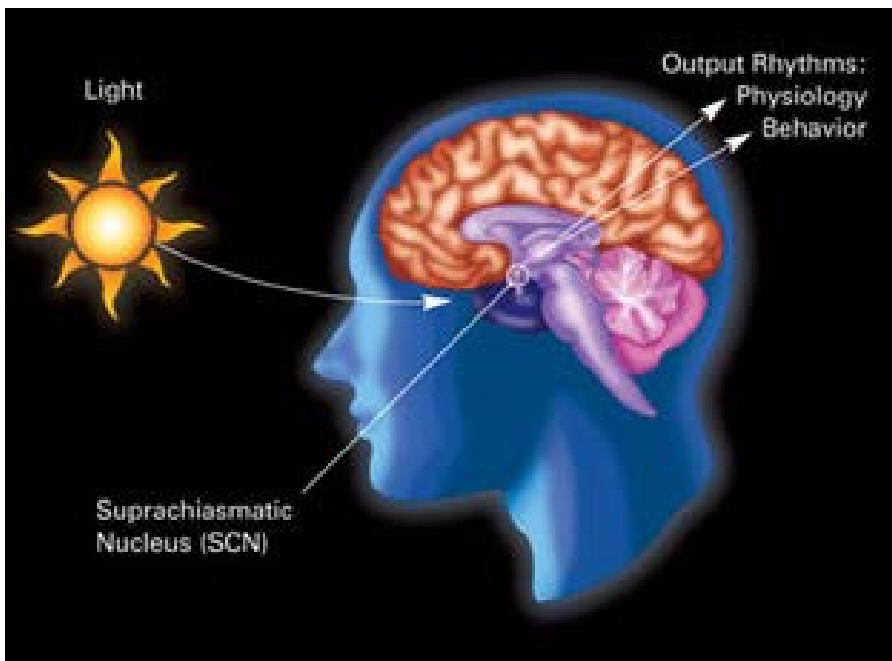
[www.primestar.co.jp](http://www.primestar.co.jp)

### Circadian Rhythm Lighting

International special committee on radio interference

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## Features of Reach

### 1、Electrical noiseless “Reach”

**CISPR: International Special Committee on Radio Interference**

International noise standards CISPR11 / 15/22 compatible  
To prevent the malfunction of precision machinery

### 2、The point light source is changed to a surface light source, achieve a uniform light “Reach”

**Mounting a MCPET of patented products in the interior of the tube MCPET Furukawa Electric's products**

MCPET, highly reflective PET foam sheet, developed and produced by Furukawa Electric. Excellent light reflectivity and diffuse reflectance performance.

Allow extensive usage as reflection board on lighting fixture in public areas, LED signboards, LCD backup lights.

Enable energy savings by reducing the number of fluorescent lamp and combination with LED.

### 3、Circadian Rhythm Lighting “Reach”

#### What are circadian rhythms?

#### **Circadian rhythms control**

Circadian rhythms are physical, mental and behavioral changes that follow a roughly 24-hour cycle, responding primarily to light and darkness in an organism's environment. They are found in most living things, including animals, plants and many tiny microbes. The study of circadian rhythms is called chronobiology.

# CISPR: International Special Committee on Radio Interference

As its full name implies, CISPR's principal task is at the higher end of the frequency range, from 9 kHz upwards, preparing standards that offer protection of radio reception from interference sources such as electrical appliances of all types, the electricity supply system, industrial, scientific and electromedical RF, broadcasting receivers (sound and TV) and, increasingly, IT equipment (ITE).

**CISPR11**

**PASS RADIO  
INTERFERENCE**

**Can be used in the Hospital !**

## CISPR 11:2015+AMD1:2016 CSV Consolidated version

### **Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement**

CISPR 11:2015 applies to industrial, scientific and medical electrical equipment operating in the frequency range 0 Hz to 400 GHz and to domestic and similar appliances designed to generate and/or use locally radio-frequency energy. This standard covers emission requirements related to radio-frequency (RF) disturbances in the frequency range of 9 kHz to 400 GHz. Measurements need only be performed in frequency ranges where limits are specified in Clause 6. For ISM RF applications in the meaning of the definition found in the ITU Radio Regulations (see Definition 3.13), this standard covers emission requirements related to radio-frequency disturbances in the frequency range of 9 kHz to 18 GHz.

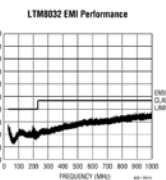
**CISPR15**

**CISPR22**

## IECEE TRF CISPR 22:2010 VB This Test Report Form applies to IEC CISPR22: 2008 Sixth Edition

### **Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement**

**Can be used in the Datacenter Car factory, factory for precision machinery !**



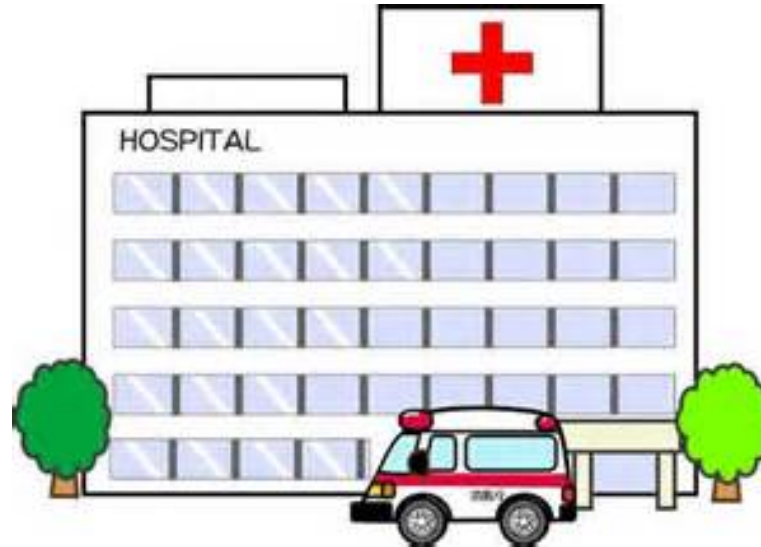
*International Electrotechnical Commission*



# CISPR11

scientific and medical equipment - Radio-frequency disturbance characteristics

**Can be used in the Hospital**



# CISPR22

Information technology equipment-

**Can be Used in the Datacenter Car factory**

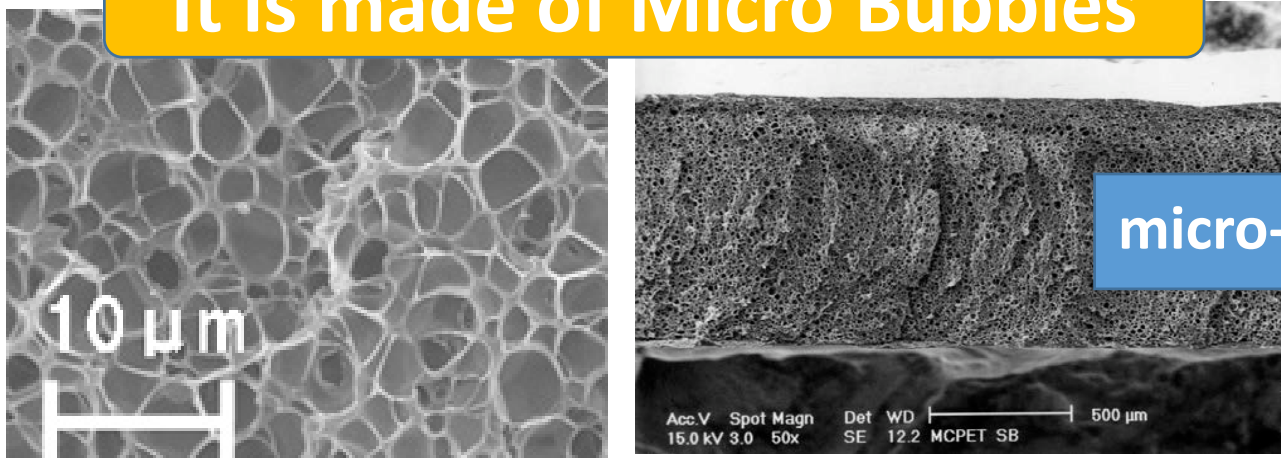




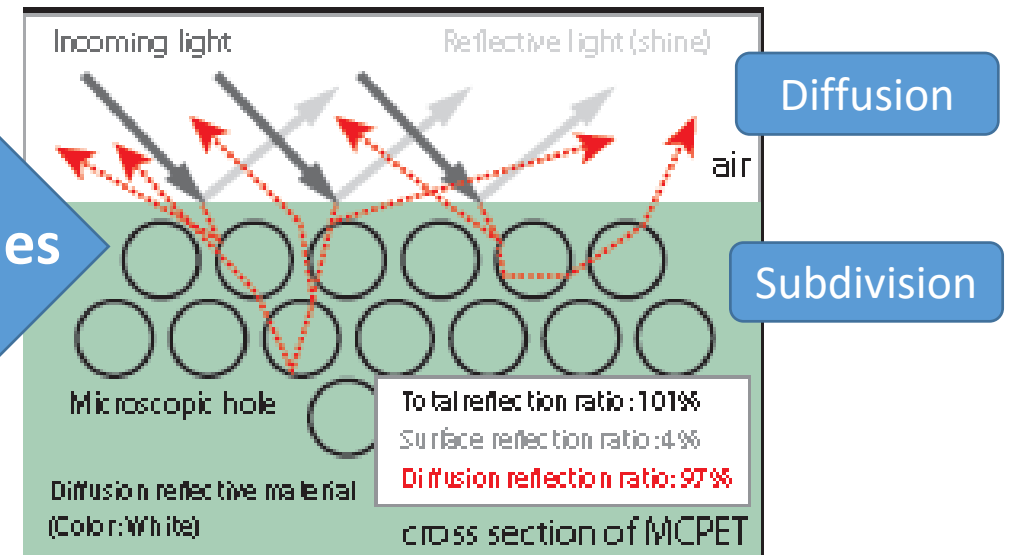
# Reflective boards for in-vehicle lighting and instrument panels "MCPET"

Reflective sheet for interior illumination and instrument panel **"MCPET"** As the movement for carbon oxide reduction is accelerated to alleviate global warming, there is a rapid increase of using LEDs for interior illumination in automobiles. Although the use of LEDs is very effective for energy saving, it raises two problems to be solved such that irregularity in illuminance is often generated and that the number of lamps has to be increased to heighten the illuminance. MCPET can solve these two problems involved with the use of LEDs. MCPET softens when heated allowing for recycling. It can reduce weight in comparison with metal reflectors. When formed three dimensionally, it can be used as a reflective sheet with higher efficiency.

## It is made of Micro Bubbles



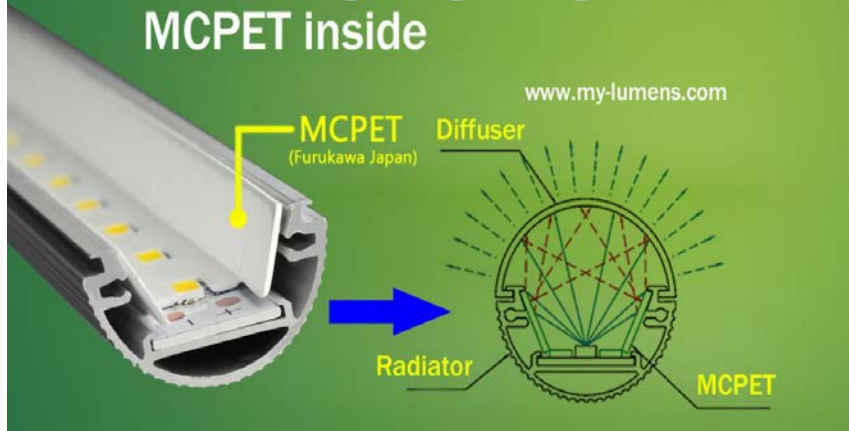
micro-bubbles



## MCPET made of micro-bubbles

Indirect lighting design with MCPET inside

Reach



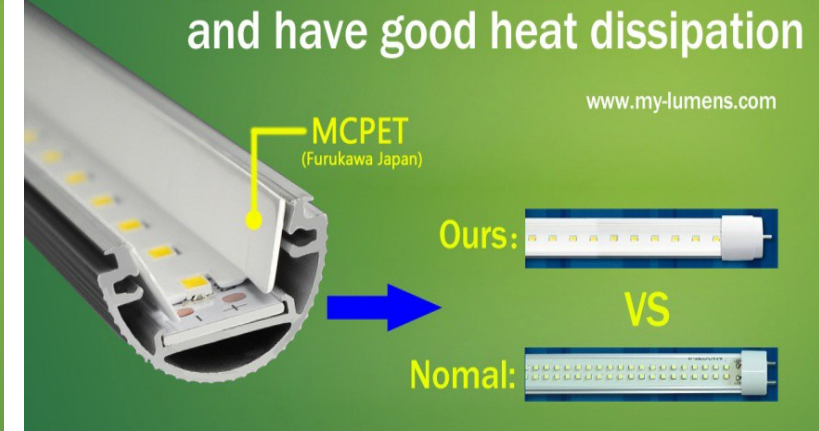
Obtain high lumen by NOT dissipating the lighting that come out from the smd chip

Reach



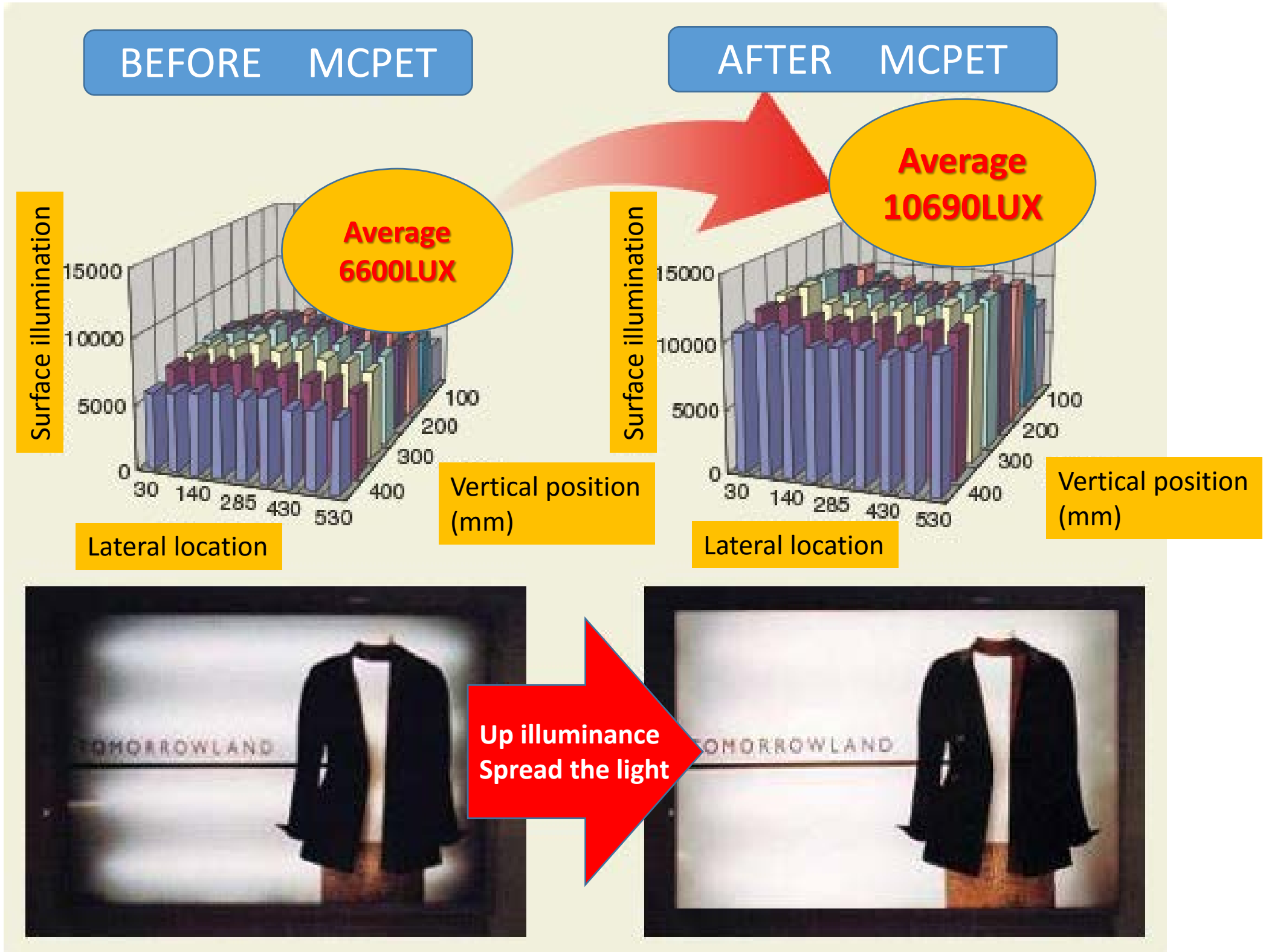
Less LEDs save more cost and have good heat dissipation

Reach



# Reflective boards for in-vehicle lighting and instrument panels "MCPET"

## Up illuminance + Spread the light



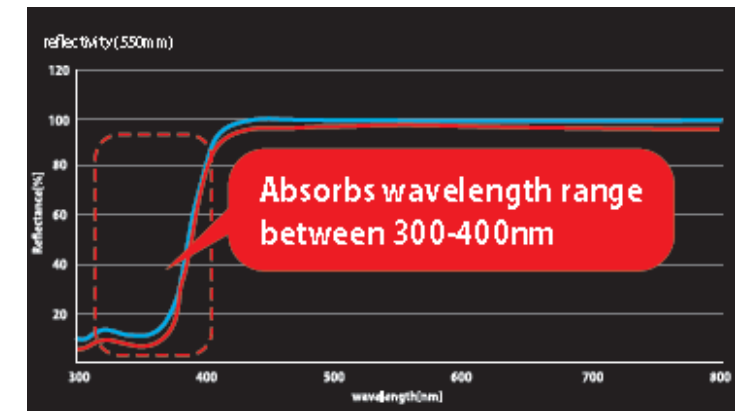
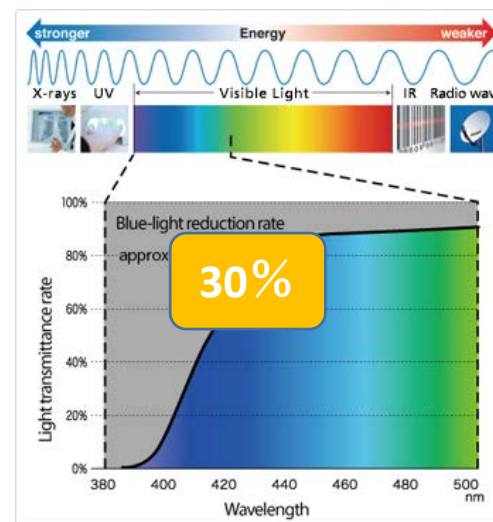
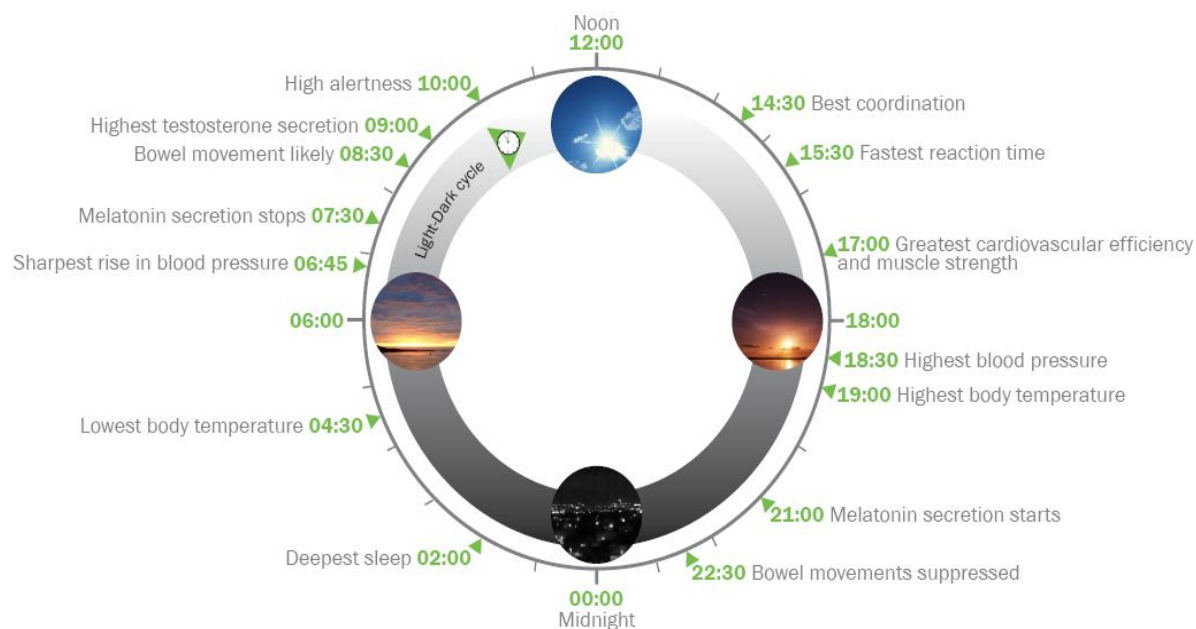
# Circadian Rhythm Lighting “Reach”

## Circadian rhythm Lighting

## What makes your eyes tired-Blue light

Your circadian (latin for “of the day”) rhythm controls many functions of your body. It is entrained by the changing spectral distribution of light – adjusting your body for the environment that it is in. Effectively we are perceiving the movement of the sun across the sky as refraction changes both the colour and spectral distribution.. This is our signal to perform our basic functions and responses

You have probably suffered circadian rhythm disruption – we also call it “Jet Lag”. You feel disoriented, disrupted and tired. Exposing yourself to daylight is one of the best cures. The recent Mars Mission simulations demonstrated extreme circadian rhythm disruption through inappropriate artificial light causing many physical and mental health issues. Following this, NASA will be installing a circadian lighting system on the International Space Station in 2016.



Our LED Tube “Reach” Cutting down on blue light that affects your eyes by about 30%!  
And saved your Circadian rhythm, get good sleep and safe in your body and eyes!



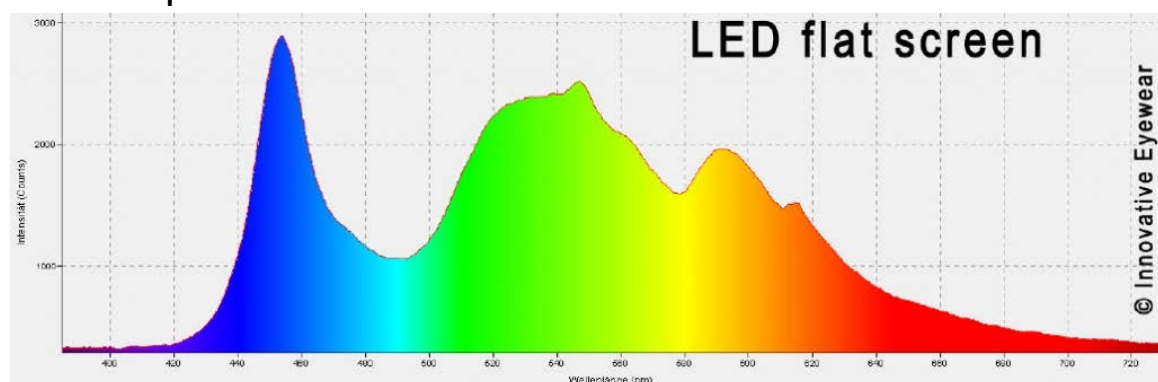
# Blue Light Protection LED Tube “Reach”

Natural daylight is made up of a relatively continuous spectrum, including all the colors. Here you can see the spectral distribution of daylight on a cloudy day. The different colors correlate with different wavelengths; at the far left of the (visible) spectrum there are the short-wave frequencies, creating violet and blue light. (UV light has even shorter wavelengths, and is not visible).

These frequencies of visible light, with wavelengths below 500 nm are called „blue light“.

Short-wave optical radiation has strong oxidative capacities, and can damage cells due to the production of free oxygen radicals. It is common knowledge that UV light can be damaging to skin and eyes, this is why sunglasses have long since been required to have 100% UV filters.

More and more of the recent medical research show evidence that the visible short-wave radiation (blue light) is equally damaging. Not only does it have a similar oxidative capacity, it also advances further into the eye itself. While UV light is mostly damaging the eye lens, where it is filtered out, blue light gets to the retina unfiltered and can damage the photoreceptor cells there.



The peak in the blue frequencies is clearly visible, a disproportionate energy distribution which is never found in natural light. This spectrum also shows an almost complete lack of red light. This artificial light can not only lead to oxidative stress within the eye, which promotes medical conditions such as age-related macular degeneration, it is also likely to disrupt the hormonal balance and therefore promote chronic diseases. Quite a lot of people also suffer from short-lived side effects when working on a screen, such as burning, stinging eyes, eye stain, headaches and unsteadiness of vision. All of this doesn't have to be the case.

**Our LED Tube “Reach” Cutting down on blue light that affects your eyes by about 30%!  
And saved your Circadian rhythm, get good sleep and safe in your body and eyes!**