

Healthy concepts in lighting



UGR (Unified Glare Rating)

It is the rate that indicates the level of glaring that the human eye is undergoing. There are several factors that affect this rate:

- The technical and constructive features of the luminaire itself.
- The installation of the luminaire (height and position with regard to the observer).
- The reflections of the surrounding materials (floor, walls, ceiling...).

The International Commission of Lighting (known as CIE, Commission Internationale de l'éclairage) has determined the values of compulsory fulfillment depending on the area of activity through the regulation EN12464-1:2011.

The design process is critical when defining the UGR rate that will finally accomplish a luminaire. **Hiding the point of light, avoiding opal glasses or using microprismatic diffusers helps to reduce the glaring of the luminaire.**



Light uniformity

Sites must have a proper lighting that guarantees the minimum values regulated by the norm in any point; **variations of the lighting levels in a room cause negative effects on the users.**

Photobiological security

The European Norm for photobiological security (EN 62471) establishes a number of criteria to determine if a luminaire entails any risk of eye or skin damages.

This regulation determines four photobiological risk groups:

GROUP OF RISK	
RG0	Risk free
RG1*	Low risk
RG2	Moderate risk
RG3	High risk

* Time under 3 h.



Flickering

Also known as **periodical blinking or the light source of a luminaire** (stroboscopic effect), it is present in almost all the artificial light sources and is caused by the looping out of the output current in the LED driver.

This rate below makes it possible to measure the significance of the problem:

- A flickering under 15% prevents dizziness, nausea and headaches.
- Under 8% this flickering is not considered to be harmful (according to IEEESA-1789-2015).