UGR RATING

UGR (Unified Glare Rating) is a method of calculating glare from luminaires, light through windows and bright light sources.

The UGR rating helps to determine how likely a luminaire is to cause discomfort to those around it. For example the discomfort that a LED Panel will cause the work force within an office. This classification ranges from 5 to 40, with low numbers indicating low glare.

Glare can be a common problem in workplaces. Inappropriate luminaires cause excessive brightness to be "bounced off" reflective surfaces, such as computer screens, whiteboards etc. This can cause disruption for the occupants of offices, in terms of headaches & eye trouble, which can then lead to employee absences.

UGR is calculated by using an equation which takes into account a number of factors that may contribute to glare caused by a luminaire, such as the angle of the luminaire, the likelihood of glare and the luminance value (lumen output). The equation that is used to calculate the UGR is:

$$UGR = 8 \log \left[\frac{0.25}{L_b} \sum \left(\frac{L^2 \omega}{p^2} \right) \right]$$

L= The luminance value of the luminaire

Lb= The value of the background luminance

ω= The solid angle of the luminaire that is seen by the viewer

p= The Guth Index. Based on the likelihood of glare, also known as Visual Comfort Probability

Σ= Shows that the equation (shown above) includes all the fittings located within the area.

There are two methods to reduce the glare that is present in relation to interior lighting: firstly, to use luminaires that are UGR<19 rated; secondly to ensure that the lighting design is appropriate for the environment they are being used in i.e. the correct number and position of luminaires.

Within an office setting, for the luminaire to be classified as "low glare" it must have a UGR below 19 at desk level. Anything above this may cause discomfort – this further enforces the need for high quality interior lighting that is rated UGR<19.

There are a number of different UGR limits that should not be exceeded in certain environments, these include:

UGR Rating	Environment
UGR ≤ 16	Technical drawing
UGR ≤ 19	Reading, writing, training, meetings, computer-based work
UGR ≤ 22	Craft and light industries
UGR ≤ 25	Heavy industry
UGR ≤ 28	Railway platforms, foyers