`Q&A for webinar - Lighting University - Visual Comfort and Artificial Lighting.

October 10th 2018

Q: How do we access blue light output on lighting products?
A>> It can be measured by using specific instrument like Spectroradiometer or by the details mentioned by the manufacturer on the product.

Q: At which viewing angle is the UGR calculated or defined?
A>> For general lighting fixtures it should be 30°, for spot lights it should be 40° to 50°.

Q: How do we inform the designer that uniformity is not the only ideal in lighting design?
A>> Uniformity should be decided as per the utility of the space. Offices, kitchens and other task areas should have uniformity of 0.6 (maximum to minimum) whereas formal living rooms, fine dining restaurants and hotel lobbies may not be uniformly lit

Q: Could you give references on how to measure UGR at the plane of work or while walking or resting?
A>> A complete list of recommendation has been given by the illuminating societies like IESNA showing UGR for given area. The various numbers of factors has to be taken into account like reflection of floor, wall and ceiling while calculation/measuring the UGR for particular area.

Q: How to decide quality and quantity of light?
A>> Various parameters but most important is the utility of the space

Q: How do we get copies of the Light Level Comfort charts?
A>> Illuminating societies like IESNA has provided the charts on their official websites.

Q: How do you calculate the UGR Levels required in any given scenario
A>> The UGR value is a dimensionless parameter which provides information about the degree of psychological glare of lighting installation in an indoor space. Generally, these values are provided by Illuminating societies after their observation practices.

Q: Is UGR only measure of Glare?
A>> Technically, Yes.

Q: How do you go about figuring out who chooses light levels or changes light levels with color changing or tuneable white application after or just at turnover?
A>> Being a Designer you should know about the required light level for particular area according to the uses. Lighting is a completely subjective subject so it all depends upon a vision of Designer for the design incorporated with the style of architecture and needs of the client.

Q: Can you explain a bit more about the effect of light on melatonin?
A>> Melatonin is sleep hormone which starts being produced 2-3 hours prior to bedtime, signalling the body that it's time to sleep. Our access to artificial light and backlit light of electronic devices that project some blue light suppress melatonin and it confuses the circadian system into thinking that it is daytime. A research showed that if

a person is exposed to light at night for 3 consecutive days, there will be a shift of delay in melatonin secretion by 2-3 hours.

Q: On what factors do we control glare?
A>> Lighting fixtures, reflectance of the materials, age of the occupants and many more.

Q: Does actual photometry equipment is enough good to obtain the desired results illuminating that kind of places?
A>> In my opinion NO, human judgement based on knowledge is important.

Q: How do you decide the Contrast Ratio? Is there any thumb rule?
A> No, judgement based and knowledge and utility of the space should give best results.

Q: What is the smart way of using coloured lights for colour effects?
A> I normally use color selectively as accent for monochromatic white light (usually 5% to 50% of the total lit up area.

Q: Could you please say something about reading lighting, long time reading and visual comfort?
A>> Long time reading in 150 – 250 lux in 3000°K to 4000°K is usually comfortable to most people.

Q: How does social start have effect on type of light as mentioned by you?
A>> People are usually comfortable in lighting environments which they have spent a longer part of their childhood.

Q: What test do you conduct for finding flickering of fixtures?
A>> Flickering is of two types- Visible which can be seen with naked eye and most of times caused by incompatibility of led driver and other is Invisible flickering which can be tested by holding your mobile's video camera up to the light and you can see bars, stripes or flickering through the camera.

Q: What do you think about the discomfort that is causing street light with 5000K or more?
A> Moon light is 4000°K, lighting as near to this is usually more comfortable for bright environments like street lights.

Q: Is blue light a hazard or do we just need to understand when and where to use it?
A>> Blue is not a hazard if you understand how much blue content in light you need for particular purpose.

Q: What are some common mistakes that you see in most commercial buildings that we should be aware of when evaluating a lighting design proposal? Also, has the strive for energy efficiency (eg: uptake of LEDs) impacted how lighting is designed for areas?
A> Visual comfort, utility of the space and beautification by light are the most important criteria while designing lighting. If these have been take care of well with knowledge, experience and design skill results should be good. The common mistakes designers make are imbalance in lighting and not setting a Hierarchy of Vision. This can be handled with the above and results shall improve.
Yes, LEDs has impacted lighting design but mostly in positive direction.

Q: Any advice for reducing glare in offices?

A> Awareness and knowledge solve most of the problem.

Q: what are the things in mind while reducing glare effect?
A> Choice of lighting fixture and placement based on utility.

Q: Does UGR level irrespective of the height of the fixture plane and work plane?
A> No, they are interconnected.

Q: Is flickering depend on the frequency of power supply or its a design thing?
A>> It depends upon the compatibility of led driver with fixture.

Q: Do manufacturers specify the nonvisible light spectrum emitting from the fixtures? Eg. UV-A. If not, how can we find out?
A> Unfortunately most of them are not. We need to ask them for this information.

Q: Would you have any concern in the use of CCTs that are between 5K and 6.5K commonly used in many areas of the world. Do you have any information suggesting alteration to the Circadian Circles?
A> Choice of CCT should be based on the time , the space is most likely to be used. I like to stay within 4000°K (daytime) - 2700°K (night time) which are most comfortable to humans.

Q: Comfort and energy are two parallel themes in lighting. What is your idea to balance them?
A> Comfort should be the priority with good lighting fixtures you can achieve both.

Q: How is the UGR of a luminaire determined?
A>> 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:

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

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.

Q: Can you specify which CCT is recommended for Office, Restaurant, Homes and Outdoor?
A>> 4000K for office areas, 2700K-3000K for restaurant, 3000K for homes and 3000K-3500K for outdoor. These values can be changed with respect to different uses of areas.

Q: In Luminaire selection, which is a right measure LED Wattage or Lumen/square method?
A>> The right measure is not only to select luminaries with high efficiency of lumen output per watt, also to check for optics and CRI value with respect to application.

Q: Is the technique of lighting with shadows not dangerous? And intrusive to the environment?
A> Depends on the utility of the space.

Q: About the chart of lighting level comfort. Are those lighting level taken from your experiences or another source?
A>> They were taken from my experience of 30 years in lighting industry.

Q: Do you use RVP to compare systems?
A>> Due to the fact that I have searched as well as experienced about visual comfort and performance, I don't need to compare the lighting systems as every factor affecting lighting is always taken care.

Q: Do you recommended temperature for tuneable lights? How about RGB color recommendations?
A>> Either tuneable light or RGB Color, the Color temperature is solely dependent upon the design and need of the area. For example, if you are designing for office area the tuneable light can vary from 2700K to 4000K but if you are designing for the Entrance lobby, the tuneable light in coves can vary from 2400K to 3000K.

Q: Can we specify contrast ratio in terms of Luminance?
A> It would be complicated practically, but can be explored.

Q: How do you judge when walking into a space if the lighting is at a discomforting level?
A>> it would be very subjective.