CIE (International Commission on Illumination）

Standard

CIE 17.443 e-ILV : Temporal Light Artefacts (TLA): In a specific environment, light stimuli that fluctuate with time or spectrum cause changes in the viewer's visual perception. The flicker, stroboscopic effects, and phantom effects below are all different types of TLAs.
Definition in CIE TN006-2016:

◎ Flicker: For static observers in static environments, the perception of visual instability caused by light stimuli that fluctuate with time or spectral distribution over time. Unlike the “flicker” and “brightness changes over time” we mentioned in the past, the environment and the observers here are static.

◎ Stroboscopic effect: For static observers (moving objects) in a non-static environment, the brightness or the change in motion perception caused by light stimuli that fluctuate with time. For example, in the case of a square wave periodic fluctuation, the continuous moving target is perceived as a discontinuous movement; if the brightness fluctuation period coincides with the target rotation period, the target is considered to be stationary.

◎ The phantom array effect: Also known as ghost, for non-stationary observers in a static environment, the perceived change in shape or spatial position caused by light or stimuli that fluctuate with time. For example, when scanning a small light source that fluctuates in a square wave period, the light source is seen as a series of spatially extended spots.

How to measure

In the AC 50Hz frequency, the domestic general strobe frequency is 100Hz, and the strobe percentage of the test luminaire is less than 3.2%, which is the limit range without stroboscopic hazard; of course, as long as the strobe percentage is within the low risk range of 8%, The strobe of the luminaire is a safe range. If it is higher than 8%, the lighting product can be regarded as unsafe.
The instrument mainly depends on the strobe percentage. Under 3.2%, there is no stroboscopic, 3.2%-8% is slightly stroboscopic, and more than 8% is stroboscopic.

What is Flicker-Free LED Lighting

The Importance of Flicker-Free LED Lighting

The human eye can sense light flashes up to 70 Hz, above which it does not sense. Therefore, in LED lighting applications, the human eye will feel flicker if the pulse signal appears at a frequency below 70 Hz.

Traditional lamps, powered by alternating current, vary in brightness as the alternating current changes periodically. Lighting strobe is formed by the light and shade changes,
Usually divided into two types:

1) changing frequency below 100Hz, at this time the strobe can be captured by the human eye;
2) frequency of change above 100Hz, this stroboscopic will not be seen.

The potential hazard of strobing on the human body, There are related biological and medical research on the possible harm that strobes may cause to human body:

1) may cause brain cell damage. DSNYLED understands that by observing the EEG, the retina of an organism can still distinguish light at frequencies of 100-160 Hz, or even up to 200 Hz, even though stroboscopic light strikes the environment so fast that it can not be detected And in response to animal experiments represented by cats, light of 100-120 Hz has caused the burn of brain cells in the brain, and the burn cells belong to the lateral geniculate body, which plays the role of controlling the eyeball.

2) may affect reading and vision. Studies have shown that fluorescent flicker on fluorescent and CRT displays can affect the trajectory of eye movements when reading text. In addition, some health exams have reported that visual impairment is caused by stroboscopic fluorescent lights.

3) may induce migraine. The experiment found that a fluorescent strobe at a frequency of 100 Hz may cause a double incidence of headache in office workers, of course, this effect is usually considered a special case, only generated in special populations. Cell phone photo identification strobe method fly it?

With the gradual development of LED lighting, more and more people will take customary cell phone to shoot the LED lamps, by watching the presence of strobe to determine whether the lamp is harmful to the human eye, this approach is not complete correct.

LED lamps are DC power supply, the light emitted by the light source will also be DC form, but the input power supply is still AC form, it is difficult to completely avoid the AC ripple through the LED light source, so there will be LED lights with digital Flashes when the camera is shooting.