Soft Lights Foundation


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# The LED Light Shape

*"Flat light sources produce Lambertian light distributions and only flat light sources do this. This means that luminous intensity and luminance are both non uniform in space for the source and what the viewer sees. ALL of illumination scientific theories are based on point light sources, which means there is spherical uniformity for luminance and luminous intensity regarding the light source and what the viewer sees."* – February, 2022 – Dr. M. Nisa Khan, President IEM Lighting Technologies and Author, *Understanding LED Illumination.*

The art and science of illumination for the past 150 years have been predicated on the foundational premise that the light source can be reduced to a single infinitely small mathematical point. From a point source, the light emanates in all spherical directions uniformly, such that taking measurements at any point in space would result in the same readings. This is shown on the left side of Figure 1.

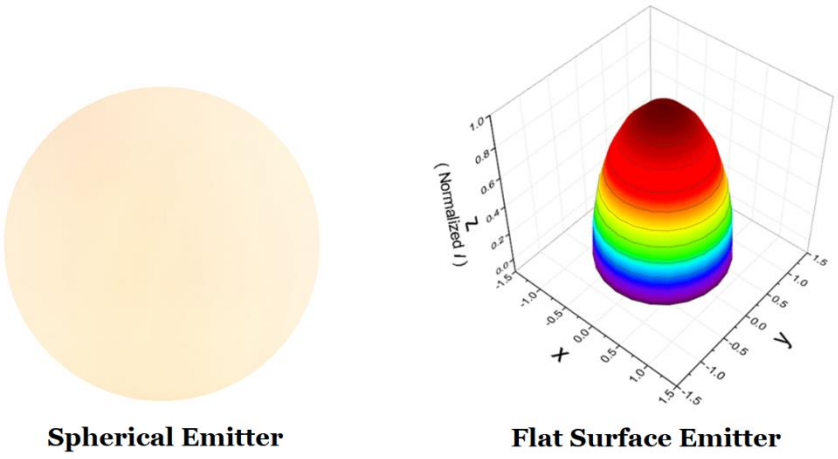


*Figure 1*

Light Emitting Diodes, however, emit light from a flat surface, meaning that there is no curvature. The light leaves the chip surface within a given escape angle and because of the flat surface, the light rays intersect. The largest amount of intersection occurs in the middle of the chip and the least amount occurs on the chip edges. The resulting shape of the light from an LED is a spatial energy profile resembling a bullet, as shown on the right side of Figure 1.

While human comfort level for the density of visible light is approximately 300 nits, LED chip makers have already exceeded 100,000,000 nits of peak luminance, resulting in high risk of short-term and long-term eye damage, with babies and children being particularly at risk. In addition, due to the small 1mm x 1mm size of an LED chip, and due to the extreme density of the light, the entire energy emitted by the chip lands on the eye nearly invariant of distance. The bullet-shaped non-uniform energy profile interferes with normal human nerve functioning, causing seizures, migraines, panic attacks, anxiety, and agitation. There are no government regulations to protect people from dangerous LED light.

Details are found on our website: www.softlights.org