

2.2 Luminous Intensity

Luminous intensity is the luminous flux emitted/unit solid angle, in a specified direction. Solid angle is given by area divided by the square of the distance and is measured in steradians. An area of 1 square metre at a distance of 1 metre from the origin subtends one steradian. The unit of measurement of luminous intensity is the candela, which is equivalent to one lumen/steradian. Luminous intensity is used to quantify the distribution of light from a luminaire.

2.3 Illuminance

Illuminance is the luminous flux falling on unit area of a surface. The unit of measurement of illuminance is the lumen/m² (lm/m²) or lux (lx). The illuminance incident on a surface is the most widely used electric lighting design criterion. Figure 4 shows some typical illuminances on different surfaces under the noon-day sun in temperate climates.

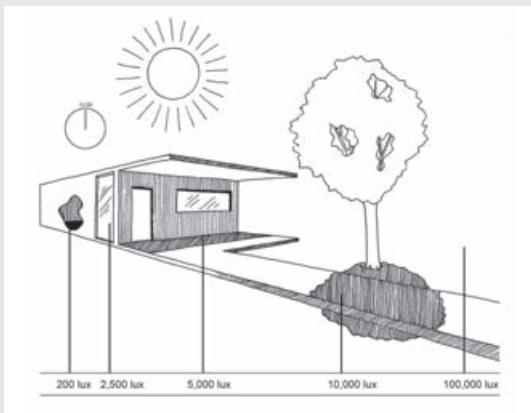


Figure 4
Typical illuminances on different surfaces under the noonday sun in temperate climates.

2.4 Luminance

The luminance of a surface is the luminous intensity emitted per unit projected area of the surface in a given direction. The unit of measurement of luminance is the candela/m² (cd/m²). Luminance is widely used to define stimuli presented to the visual system.

2.5 Reflectance

As might be expected, there is a relationship between the amount of light incident on a surface and the amount of light reflected from the same surface. The simplest form of the relationship is quantified by the luminance coefficient. The luminance coefficient is the ratio of the luminance of the surface to the illuminance incident on the surface and has units of candela/lumen. The luminance coefficient of a given surface is dependent on the nature of the surface and the geometry between the lighting, surface and observer.

There are two other quantities commonly used to express the relationship between the luminance of a surface and the illuminance incident on it. For a perfectly diffusely-reflecting surface, the relationship is given by the equation:

$$luminance = \frac{(illuminance \times reflectance)}{\pi}$$

where luminance is expressed in candela/m² and illuminance is expressed in lumens/m² or lux (lx).