

4.3.2 Classification

General lighting for interiors — luminous flux distribution

Luminaires for general indoor lighting are classified by the CIE according to the percentage of the total luminous flux emitted above and below a horizontal plane through the luminaire (Table 4.7).

Table 4.7 CIE classification of general indoor luminaires

Luminaire class	Percentage of total luminous flux emitted above the horizontal	Percentage of total luminous flux emitted below the horizontal
Direct	0–10	90–100
Semi-direct	10–40	60–90
General (diffuse)	40–60	40–60
Semi-indirect	60–90	10–40
Indirect	90–100	0–10

Spotlights — luminous intensity distribution

Spotlights are characterised by their tight beam control. Most have a rotationally symmetric luminous intensity distribution. The most common way of classifying spotlights is by their beam spread. The beam spread of a spotlight is the angle over which the luminous intensity is 50 percent or more of the maximum luminous intensity in the beam.

It is important to note that beam spread, expressed in this way, is not a good indication of the appearance of the beam. A better classification of the appearance of the beam is the beam size. The beam size is derived from the distribution of illuminance across a uniformly reflecting surface at a given distance from the spotlight. This distribution is differentiated to obtain the illuminance gradient. The locations of the peaks in the illuminance gradient distribution define the edges of the beam. The beam size is given as the angle subtended at the spotlight by the distance between the two edges and is expressed in degrees. The magnitude of the peaks in the illuminance gradient profile indicate the sharpness of the edge of the beam; the higher the peaks, the sharper is the edge of the beam.

Floodlights — luminous intensity distribution

Floodlights are classified according to their beam spread. The beam spread is the angle over which the luminous intensity drops to a stated percentage of the maximum, usually 50 percent or 10 percent. For a floodlight having a rotationally symmetric luminous intensity distribution, only one figure is necessary to specify the beam spread. For a floodlight with an asymmetrical luminous intensity distribution, as is usual with rectangular floodlights, two beam spreads are needed, one for the vertical plane and one for the horizontal plane. If the luminous intensity distribution in either of these planes is itself asymmetrical relative to the beam axis, two angles are given for that plane and one for the other plane. A simple classification of beam spreads is sometimes used (Table 4.8).

Luminaire classification	Beam spread at 50 percent of maximum luminous intensity
Narrow beam	< 20°
Medium beam	20° to 40°
Wide beam	> 40°

Table 4.8
Floodlight beam spread classification