

where

- $L_b$  is the background luminance in  $\text{cd}\cdot\text{m}^{-2}$ , calculated as  $E_{\text{ind}} \cdot \pi^{-1}$ , in which  $E_{\text{ind}}$  is the vertical indirect illuminance at the observer's eye,
- $L$  is the luminance of the luminous parts of each luminaire in the direction of the observer's eye in  $\text{cd}\cdot\text{m}^{-2}$ ,
- $\omega$  is the solid angle in steradian of the luminous parts of each luminaire at the observer's eye,
- $p$  is the Guth position index for each individual luminaire which relates to its displacement from the line of sight.

All assumptions made in the determination of  $UGR$  shall be stated in the scheme documentation. The  $UGR$  value of the lighting installation shall not exceed the value given in Clause 5.

The recommended limiting values of the  $UGR$  form a series whose steps indicate noticeable changes in glare.

The series of  $UGR$  is: 10, 13, 16, 19, 22, 25, 28.

NOTE 1 The variations of  $UGR$  within the room can be determined using the comprehensive tables for different observer positions, as detailed in CIE 117-1995.

NOTE 2 If the maximum  $UGR$  value in the room is higher than the  $UGR$  limit given in Clause 5, information on appropriate positions for work stations within the room should be given.

NOTE 3 If the tabular method is not applicable and the observer position and the viewing directions are known the  $UGR$  value can be determined by using the formula. However limited research has been done, to determine the applicability of existing limiting values. Limits for this condition are under consideration.

### 4.5.3 Shielding against glare

Bright sources of light can cause glare and can impair the vision of objects. It shall be avoided for example by suitable shielding of lamps and roof lights, or suitable shading from bright daylight through windows.

For luminaires, the minimum shielding angles (see Figure 1) in the visual field given in Table 2 shall be applied for the specified lamp luminances.

NOTE The values given in Table 2 do not apply to up-lighters or to luminaires with a downward component only mounted below normal eye level.

**Table 2 —Minimum shielding angles at specified lamp luminances**

Lamp luminance $\text{kcd}\cdot\text{m}^{-2}$	Minimum shielding angle $\alpha$
20 to < 50	15°
50 to < 500	20°
$\geq 500$	30°