

For daylight calculations, reduction of glazing transmittance due to dirt deposition should be taken into account.

The designer shall:

- state the MF and list all assumptions made in the derivation of the value,
- specify lighting equipment suitable for the application environment and
- prepare a comprehensive maintenance schedule to include frequency of lamp replacement, luminaire, room and glazing cleaning intervals and cleaning method.

The MF has a great impact on energy efficiency. The assumptions made in the derivation of the MF shall be optimized in a way that leads to a high value. Guidance on the derivation of MF for artificial lighting systems can be found in CIE 97-2005.

4.11 Energy efficiency requirements

Lighting should be designed to meet the lighting requirements of a particular task or space in an energy efficient manner. It is important not to compromise the visual aspects of a lighting installation simply to reduce energy consumption. Light levels as set in this European Standard are minimum average illuminance values and need to be maintained.

Energy savings can be made by harvesting daylight, responding to occupancy patterns, improving maintenance characteristics of the installation, and making full use of controls.

The amount of daylight varies throughout the day depending on climate conditions. In addition, in interiors with side windows the available daylight decreases rapidly with the distance from the window. Supplementary lighting may be needed to ensure the required illuminance levels at the work station are achieved and to balance the luminance distribution within the room. Automatic or manual switching and/or dimming can be used to ensure appropriate integration between artificial lighting and daylight.

A procedure for the estimation of the energy requirements of a lighting installation is given in EN 15193. It gives a methodology for the calculation of a lighting energy numeric indicator (LENI), representing the energy performance of lighting of buildings. This indicator may be used for single rooms on a comparative basis only, as the benchmark values given in the EN 15193 are drawn up for a complete building.

4.12 Additional benefits of daylight

Daylight can supply all or part of the lighting for visual tasks, and therefore offers potential energy savings. Additionally, it varies in level, direction and spectral composition with time and provides variable modelling and luminance patterns, which is perceived as being beneficial for people in indoor working environments. Windows are strongly favoured in work places for the daylight they deliver, and for the visual contact they provide with the outside environment. However, it is also important to ensure windows do not cause visual or thermal discomfort, or a loss of privacy.

4.13 Variability of light

Light is important to people's health and wellbeing. Light affects the mood, emotion and mental alertness of people. It can also support and adjust the circadian rhythms and influence people's physiological and psychological state. Up to date research indicates that these phenomena, in addition to the lighting design criteria defined in EN 12464-1, can be provided by the so-called "non-image forming" illuminances and colour appearance of light. Varying lighting conditions in time by higher illuminance, luminance distribution and wider range of colour temperature than specified in this European Standard with daylight and/or dedicated artificial lighting solutions can stimulate people and enhance their wellbeing. The recommended bands of variation are under consideration.