

3.6 Choice of lamp and luminaire

The choice of lamp will affect the range of luminaires available, and vice versa. Therefore, one cannot be considered without reference to the other. One method of design is to follow a procedure that does not start with identifying a single lamp and luminaire combination, but rather rejects those combinations that are unsatisfactory. In this manner, whatever remains will be acceptable and a final choice can be made by comparison. With such an approach, if all available choices are eliminated this probably indicates that one or more of the objectives are unrealistic. Finally, all the un-rejected luminaire and lamp combinations are acceptable, and the most efficient, economical and architecturally acceptable scheme can then be selected.

3.6.1 Selection of lamp characteristics

The designer should compile a list of suitable lamps by rejecting those that do not satisfy the design objectives. For general guidance, see Lamps (see CD). However, up-to-date manufacturers' data should be used for final selections.

The run-up times of all but low-pressure fluorescent discharge lamps are unsatisfactory for applications requiring instant illumination when switched on, unless auxiliary tungsten or fluorescent lamps are provided.

Lamps must have colour-rendering properties suited to their intended use. Good colour rendering may be required in order to achieve better discrimination between colours where this is part of the visual task. Alternatively, good colour rendering may be required to achieve a particular appearance or degree of comfort (e.g. in offices, merchandising, or leisure activities). The choice of colour appearance can be used by the designer to create an appropriate 'atmosphere'. For example, 'warm' colour appearance might be selected for informal situations, whereas a 'cold' appearance could be associated with formality. This is an entirely subjective judgement, but adjacent areas should not be lit with sources of significantly different apparent colour unless a special effect is required.

The life and lumen maintenance characteristics of the lamps must be considered to arrive at a practicable and economic maintenance schedule.

Where moving machinery is used, care should be taken to avoid stroboscopic effects. All lamps operating on an alternating current exhibit some degree of cyclic variation of light output. It is most significant with discharge lamps that do not employ a phosphor coating. The problem can normally be reduced or eliminated by having alternate rows of luminaires on different phases of the supply and ensuring that critical areas receive illumination in roughly equal proportion from each phase. Alternatively, some lamps may be operated from high frequency electronic ballasts, or illumination from local luminaires (with acceptable lamps that do not cause stroboscopic problems) can be used to swamp the general illumination.

One other factor that may be a limitation on the use of certain lamp or circuit types is minimum starting temperature. Particularly in the case of linear fluorescent lamps, this is also influenced by the luminaire design.