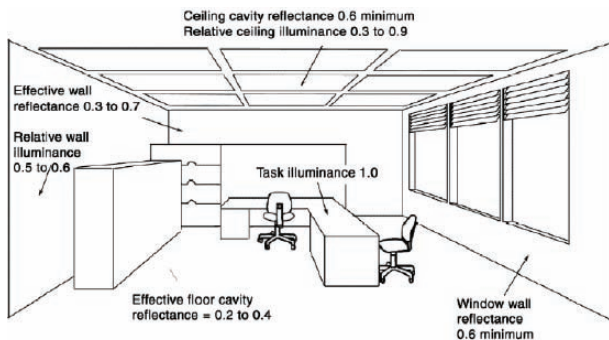


Office Lighting Guidance

When considering the design of lighting installations in areas where display screens are present, the most relevant and referred to document is the Society of Light and Lighting's LG7: Office lighting. The following guidance incorporates key elements of LG7, but adds Clearvision's own emphasis and interpretation. For a copy of LG7 itself, please contact the Society of Light and Lighting at CIBSE.

Room Colour & Surface Reflectances

There is more to producing a pleasant and ergonomic lighting scheme than just lux figures and luminance limits. Unless you are looking at a light source directly, most of the light visible within a space is reflected from the room surfaces and furniture.



'The average wall illuminance above the working plane, from both the direct and reflected components, should be at least 50% of the average horizontal illuminance on the working plane.'

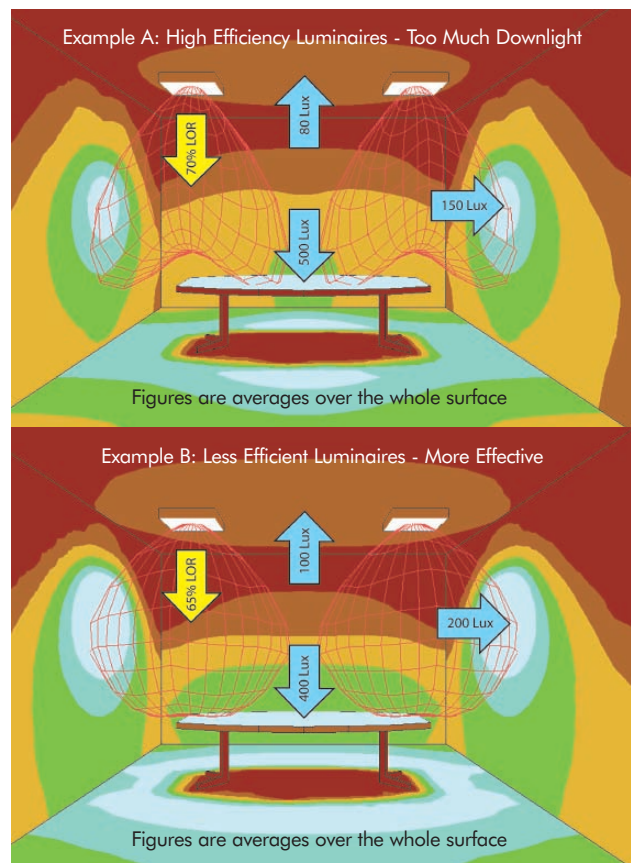
'The average illuminance on the ceiling from both direct and reflected components, should be at least 30% of the average horizontal illuminance across the working plane.'

Additionally, LG7 specifies that:

1. No one wall should be less than 30% of working plane illuminance.
2. Where walls may be seen reflected in any display screens, excessively bright patches should be avoided.
3. In large spaces with ceilings <2.4m it may be difficult to achieve 30% of task illuminance on the ceiling. A figure as close to this target as possible should still be aimed for.

These figures go some way toward emphasising the importance of lighting room surfaces and not just the working plane within an office space. The light distribution of the luminaire plays a large part towards achieving these goals, especially when the only or main lighting solution is recessed modular products.

The majority of Clearvision's recessed direct luminaires are lens, rather than louvre based. These lenses provide a wider, rounder output (as example B, but not necessarily less efficient) without compromising glare control, something that louvres (example A) can rarely achieve. Although LG7 compliance is all about the overall scheme and not just a luminaire specification, this is one of the closest 'single product solutions' to LG7 available anywhere. This is significant because of the stringent energy limits for modern offices, which many 'LG7' style luminaires cannot meet. In fact the low energy satisfaction of LG7 illuminances is probably the major specification criterion for modern office space. However, it is important to remember that LG7 was produced for guidance and is not law in the same way as part L of the Building Regulations. It also needs to be



remembered that people actually experience luminance on walls and ceilings, not the illuminance in the LG7 ratios. Putting light onto a very dark coloured wall would make little difference to the space and that light may be better deployed elsewhere. The most common dark walls in offices are glass walls at night where blinds are not drawn.

Display Screens.

Background

The original emphasis in LG3:1989 was largely on the potential for distracting screen reflections produced by windows and luminaires. Although the problems created by windows were always much greater than by luminaires, LG3 created the geometry solution for limiting screen reflections from luminaires. This was a clever but impractical combination of workstation set-up matched geometrically to an array of ‘categorised’ luminaires depending on a defined angle of luminance control.

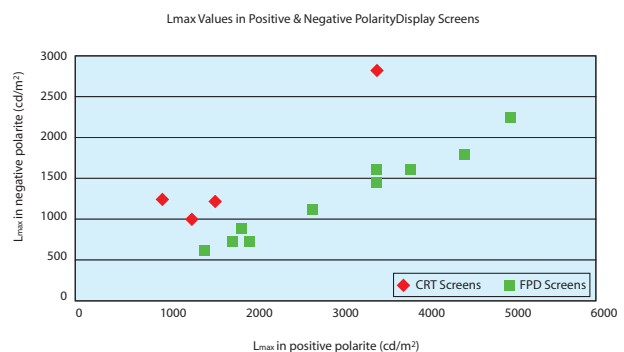
In its application by the industry LG3 was eviscerated down to one simple element, the Category 2 luminaire, which for 10 years dominated lighting schemes. They emitted very little sideways light, making both walls and ceiling appear very dark in comparison to desks. The result was workplaces with a very poor balance of light and which were often unpleasant to work in. The illuminance ratios in LG7 (see above) existed in previous lighting guidance (the Code for Interior Lighting), but were stipulated in the guide in order to prevent the recurrence of the problems associated with Category 2.

Current guidance on screens

There is a residue of the old guidance contained in all the current publications such as LG7, EN12464: 2002 and ISO9241-7, which are still referring to old luminance limits for screens tested in the mid-90s. However LG7 gives discretion to the designer over screen reflection limits and so some thought should be given before any limits are specified. They should be considered if they are

relevant to the space in question, but moderated in the knowledge that published guidance is based on display screen information that is a decade out of date. This point is important, because an unnecessary stipulation on luminance limits can make an old style Category 2 type scheme more likely with all the attendant problems. Essentially it would make the LG7 illumination balance harder to achieve.

It is widely recognised that modern screens are very tolerant of luminaire reflections except for certain rare types of dark displays. Display screen technology is developing far more rapidly than published guidance can accommodate, and so all available figures are inevitably out of date. However, the reality is that screens are always becoming brighter and creating well lit background views for users therefore increases in importance.



Studies published since most current lighting guidance, such as Lighting Research & Technology vol. 35 – by Owen Howlett (above) and some manufacturer’s data suggest that much higher values than 1500 cd/m² are acceptable with the average being around 2500 cd/m². Some flat screen monitors were found to tolerate images as bright as 4000 cd/m² when using positive polarity software (2000 cd/m² with negative polarity software).