

## Briefing Note 6

### Domestic Lighting Considerations

This is an internal document and represents the views of Haysom Ward Miller Architects.

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Legislation concerning lighting is changing quite rapidly. The building regulations, Part L: (Conservation of Fuel & Power) currently stipulates that 25% of light fittings in new domestic construction should only be suitable for use with low energy lamps. This ratio is likely to increase as the regulations move towards their target of achieving zero carbon housing by 2016. Along with this legislation, many high energy light bulbs are being phased out, so lighting designed for high wattage lamps are unlikely to function as designed for very much longer. For the purposes of the Building Regulations, a "low energy" fitting is defined as one with an overall efficiency of at least 40 lumens/watt.

It is perhaps worth noting here that what most people generally refer to as "lightbulbs" and "lights" are usually termed "lamps" and "fittings" respectively by the industry. To avoid confusion we will follow the industry terminology here. In the design of lighting these are two main considerations: the choice of lamp and the most appropriate location for the fitting.

#### Lamps

Tungsten incandescent lamps are, as mentioned above, in the process of being phased out. These have traditionally been used as the most common form of general lighting in domestic properties, usually with an output of 60W or 100W, and giving a warm yellowish light. The resistance to the phasing out of these lamps is usually because of the warm quality of light they produce. They have a limited life - traditionally they were given a life expectancy of 1000 hours or so.

Tungsten halogen (often referred to simply as "halogen") lights also produce a bright warm light, and are often used as recess lights with dichroic lamps. These are also very popular as they add a sparkle to a space. Although slightly more efficient than the traditional tungsten lamps, they do **not** qualify as low-energy light sources. Typical lamp life will be in the region of 2000 hours.

Under the building regulations it is still currently permissible for 75% of fittings to take incandescent and halogen lamps. However if one is to take a more long term view, both in terms of our responsibility to the environment, and the risk of designing a lighting scheme around lamps which in future may not be replaceable, then it seems prudent to consider a wider use of the low energy light sources.

The technology of compact fluorescents is keeping pace with these changing demands and new lamps can often produce a similar quality of light with far less wattage. Although compact fluorescent lamps are inevitably less efficient than straight fluorescent light sources, they still qualify easily as low energy. They are generally readily available, inexpensive and have a long life - 5000-6000 hours is typical. Criticisms in the past have tended to be of light quality and colour (which are improving), slow start-up (again, better with modern lamps) and mercury content (inevitable with all fluorescents, but minimal in modern lamps).

Metal halide lamps, usually used for external flood lighting, produce a very bright white light source with a low wattage, and there are an increasing number of fittings on the market now for internal use. The smallest of these are rated at just 20W. Lamp life is very long (a typical rating is 6000-10000 hours) and colour rendition can be excellent. On the negative side, the lamps are quite expensive (£20 or more, depending on lamp type), and they require relatively lengthy warm-up and cool-down times - a fitting can typically take 5 minutes or so to reach operating temperature, and cannot be relit for 5 or 10 minutes after being switched off. Light intensity is very high, and fittings are usually designed to screen the lamp from the viewer's eye.

The technology for LEDs is also advancing rapidly, with lamps now available which can fit in tungsten halogen fittings. It appears likely that LEDs will soon match tungsten halogens, both in terms of output and colour spectrum. The efficiency of white LED lamps designed for use in standard fittings is not very high at present, but is likely to improve in the future.

