

INFORMATION SHEET : 4

Lighting and accessibility: External and security LED lighting

This brief guidance for people suffering because of artificial lighting at work aims to help them to remain in employment. The information is also to assist colleagues, managers and HR departments wanting to improve accessibility in the workplace.

What's the problem?

Lighting has changed fundamentally in recent years. Incandescent and halogen light sources have been banned and replaced by new technologies. First by new forms of fluorescent lighting (including curly CFLs 'Compact Fluorescent Lights') and now by 'LED' ('Light Emitting Diodes, also known as 'solid state lighting'). In recent years there has been an increasing use of external LED and security lighting for commercial and residential use.

Some people experience pain and ill health when exposed to these newer forms of lighting.

Some of these people have existing health conditions and find their symptoms are made worse. These conditions include: migraine and headache, light-sensitive skin conditions, autistic spectrum disorders, lupus and eye damage. Others without any previous health condition find they are unable to tolerate newer lighting technologies.

There is also growing concern about the impact of new forms of artificial light on the wider population, especially on circadian rhythm (body clock), sleep disruption, eyesight and mental health. Outdoor light at night also causes light pollution, which can result in ecological harm and disruption.

How are people affected?

Symptoms reported include eye pain, migraine, headaches, skin burning and rashes, fits, difficulties in focusing and thinking clearly, anxiety and sensations of unease and discomfort. Symptoms which last for an extended period and have a severe adverse impact on everyday life can mean that the person concerned meets the definition of "disabled" set out in the Equality Act 2010. This means that employers and service providers may have specific duties to make reasonable adjustments for them.

External LED lighting can cause social exclusion, leaving some light-disabled people unable to access the streets after dark. Increasingly, access to the outdoors is limited by LED outdoor lighting including security lighting, street lighting, shop signs and Christmas lighting displays. It is distressing to be trapped indoors. Some people cannot leave their homes without risking pain and ill health. The resulting isolation and social exclusion impacts on mental health.

What causes people to experience adverse reactions to external LED lighting?

More research is needed to fully understand what is causing these problems. It is complicated because people are diverse and affected by different aspects of light. Some issues are:

Glare – Can cause visual discomfort and can seriously impair vision. It is dependent upon the intensity and directional nature of the LED and the sensitivity and age of the person affected.

Intensity – The strength or amount of light produced by a specific lamp source.



Flicker – The periodic flickering of light used for advertising and attraction seeking purposes can be distracting and like glare, irritate and cause visual distress to sensitive individuals. Flicker can be particularly problematic for those with epilepsy, migraine and autism spectrum disorders.

Intrusion – Light trespassing into an area beyond the intended lit area, such as into adjacent residential properties where it can cause nuisance, discomfort or disturb or prevent sleep.

High levels of blue light – Blue light has higher energy and so can cause more discomfort and dazzle, at night it can disrupt the body's biological clock (circadian rhythm). Scientific research shows that blue light at night may contribute to increased levels of cancer, diabetes, heart disease and obesity.

LED lamps emit light that is often highly directional with low levels of dispersion. This can cause glare, leading to discomfort and symptoms such as headaches. Also, their light spectrum is often irregular compared to that from sunlight and other incandescent sources such as firelight or tungsten filament lamps.

Guidance for installing external lighting (including security lighting)

At present, we are unable to provide guidance on the specific types of lighting to install when designing for external lighting. However, it's important to be aware that external and security LED lighting:

- » can affect the comfort and health of your neighbours and passers by
- » can cause light pollution and can be a statutory nuisance (in UK legislation).

Therefore outside lighting should be kept to a minimum. Careful consideration needs to be made of the impacts. We suggest adopting the following principles:

- » **Is the proposed lighting really necessary?** Avoid installing lighting wherever possible and don't install outdoor lighting at all unless it is absolutely necessary. Don't install multiple lighting or merely decorative lighting.
- » **Consult your neighbours** Check and ensure none of them have sensitivities to particular forms of lighting. Early discussion can help avoid problems later.
- » **Do not 'over light'** this is a major cause of obtrusive light (and a waste of energy). Is the proposed lighting the minimum required to serve its purpose? Will there be any light pollution from the proposed light?

Be LightAware

We are asking individuals and organisations to be LightAware. This means:

- » knowing the potential impact of the lighting you have or plan to install
- » consulting with neighbours and other local residents before installing external or security LED lighting and meeting their needs
- » ensure lighting motion sensor systems are not triggered by movement outside your property
- » covering exposed lamps with diffusers and avoiding exposed LED chips.
- » make external and security LED lighting as unobtrusive as possible and avoid light trespass

Do not use flashing or stroboscopic lighting

Flashing advertising or Christmas lights can cause health problems for many people including inducing fits in some people with epilepsy and severe distress to some with autism.

Switch it off!

Please ensure that external lighting is switched off when not required, for example on a timer to ensure that it is switched off after 10pm or when not in use.

