

# Everything you ever wanted to know about replacing your halogen lights (and more)

In the last 20 years halogen lighting has become very popular, particularly in newly built houses. The crisp, white light and improved lighting levels from halogen bulbs have been most popular in kitchens and bathrooms, however in recent years downlighters have increasingly been installed in other areas around the house.

## What type of halogen lamps have I got?

Halogen bulbs come in many shapes and forms - in this article we are considering reflector bulbs which are typically found in spotlights and recessed downlighters. The most common type of halogen bulb is the **GU10** bulb (*right*) - this runs at mains voltage (230V), and is typically rated at 35W or 50W. These can be identified by the dumbbell-shaped pins - the bulbs are twisted to release from fittings.



Some lighting systems are low-voltage, running at 12V with the help of a transformer. Low-voltage systems use direct rather than alternating current and so are more efficient than mains-voltage halogen.



The two main types of low-voltage halogen bulbs are the **MR16** (*left*, two inches in diameter) and the smaller **MR11** (one and three-eighths of an inch across) - these can be identified by the slim pins on the base - these pull straight out of fittings. Low-voltage bulbs are typically rated at 20W or 35W.

## What are the problems with halogen lamps?

Although halogen lights have brought a good quality of light to modern homes, they are still an inefficient technology. More than that, however the sheer number of fittings in some properties mean that you can end up using 500W just to light your kitchen.

Halogen bulbs typically last for around 2,000 hours, and need to be changed frequently - this can be a pain if you have a large number of fittings around the home.

Because of their inefficiency halogen bulbs generate a large amount of heat, and usually this is reflected away in the beam. In summer in particular this can be uncomfortable to stand under, and adds to unwanted heat gain in the house generally.

## Are some halogens better than others?

Yes - if you're looking for a quick, low-cost way to reduce your energy consumption then look for "energy-saving" halogen bulbs, sometimes labelled IRC halogen. These are available in MR16 and GU10 formats, and work by refocussing the heat they generate back onto the filament to help it burn more efficiently - this saves 20-30% on energy consumption.

Energy-saving halogen bulbs aren't commonly available in the shops but are readily available over the internet - they are a little more expensive but will pay for themselves two or three times over in energy savings.

## What about compact fluorescent bulbs?

Mains voltage halogen bulbs can be replaced with compact fluorescent energy saving bulbs (*right*) - these are usually 7, 9 or 11W. Although these have their place, quality varies tremendously between brands and in our experience they do seem to fail frequently. The main problems are the slow warm-up times compared to other energy-saving bulbs (this is a necessary compromise because they need a different chemistry to handle the heat build-up), and a tendency to become dimmer over time.



Small compact fluorescent bulbs such as these are limited in their power and light output and cannot be focussed into a beam. As a result they are less suitable where worktop lighting is important, and best suited to general area lighting.

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## LED bulbs - the new kids on the block

In the last ten years LED technology has developed rapidly, and there are now realistic LED alternatives to most halogen reflector bulbs. The best LED replacement bulbs are virtually indistinguishable from halogen bulbs in their light output and quality, and use only a fraction of the power (typically between 4 and 8W).



Other than their efficiency, their major advantage is their long lifespan, at between 25,000 and 40,000 hours they last up to twenty times longer than halogen bulbs. Other plus points include a cool beam and instant turn-on at full power.

### What to watch...

Of course every technology has its downside, and LED's achilles heel is its upfront cost, with good-quality bulbs costing from £15-£30; however with three hours' use a day the investment will typically pay back in under 5 years - a much quicker payback than solar PV, and well within the lifespan of the bulb.

Another issue to be aware of is the size of LED bulbs - although the latest models are equivalent to halogen bulbs in size, older and more powerful GU10 LEDs are longer, and may protrude from some recessed fixings. Fixings can be replaced with deeper models for a modest sum.

If you are planning on replacing your low-voltage halogens with LEDs, be aware that some transformers need a minimum load (say 20W), therefore if you install a few low-power LEDs with a total power draw under this threshold your lights may not work at all!

Contrary to popular belief, LEDs do still generate a lot of heat - unlike incandescent bulbs they must conduct this heat away from the LED chips efficiently to prevent early failure. They do this using a heat sink and fins around the body of the bulb to disperse heat to the surrounding air. This aspect is important to remember if you have recessed fittings - don't place

insulation or anything else on or close to the bulbs to maintain airflow and reduce the fire risk. Ideally a box should be built around top-floor fittings to keep loft insulation well clear.

### Buying LED bulbs

LED bulbs are sometimes offered in different beam types. There are often two decisions to be made when purchasing LED bulbs - one is **beam width**. A standard halogen bulb has a beam width of 35 degrees, and you should decide whether this is appropriate for your replacement LED bulbs. Recessed downlighters cannot usually be directed onto worktops, therefore it is better to aim on the wide side; if, however, you have spotlights then you may wish to have something narrower like 25 degrees.

The other choice you may have is **colour temperature** - this is how visually "warm" the beam is. A "warm white" beam (2800-3000K) is a good match for halogen bulbs; A "neutral white" (4000K) is less yellow and a good compromise if there is usually some daylight too. "Cool" or "daylight white" (6000K) is a cold white, similar to the light from an overcast sky, and can appear quite stark and clinical at night.

As with halogens, the most efficient LED bulbs are available online - for reliability it usually makes sense to stick to the well-known brands such as Philips, Osram, Sylvania, Megaman and GE. Output is measured in lumens - a good rule of thumb is to multiply your halogen bulb power by 10 to get a suitable lumen output, i.e. a 35W bulb should be replaced by a 350 lumen LED, although beware manufacturer's exaggerated claims. Finally, try one before you commit to buying lots!

### About Eastleigh Transition Network

Transition is a community-led response to pressures of climate change, fossil fuel depletion and increasingly, economic stagnation. Eastleigh Transition Network aims to support everyone living or working in the Borough of Eastleigh to plan for a 'transition' from our current total dependency on fossil fuels - to support our local economies and move towards a more viable and sustainable future. [etnet.org.uk](http://etnet.org.uk)

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