



TEST LAB LIGHT BULBS

OUR EXPERTS EXPLAIN NEW RULES FOR LIGHT BULB PACKAGING AND PUT 11 BULBS TO THE TEST

Incandescent bulbs continue to be phased out in favour of more energy-saving alternatives, and this September new regulations governing the information on the packaging of energy-saving lamps (including compact fluorescent lamps (CFL), halogens and LEDs) are coming into effect. These should help you understand how long a bulb is expected to last and give more information

on its light quality. We explain the new packs and give test results for 11 CFLs and halogens.

Lighting the way

Here's what to look for to find the bulb for you:

- **LAMP FITTING AND DIMENSIONS** The fitting refers to the cap and is often coded: **B22** or **BC**: Standard-sized bayonet cap **B15** or **SBC**: Small bayonet cap



E27 or **ES**: Standard-sized Edison screw fitting
E14 or **SES**: Small Edison screw fitting
GU10: A two-pin fitting, usually for spotlights. The length and diameter of the bulb, in millimetres, are likely to be listed and should help you find a bulb to fit your lampshade.

■ **WARM-UP TIME** How long the lamp takes to reach 60% of its full output. If it's within a second, it can be labelled as 'instant full light'. Which? rates start-up time based on output measurements at three, 10 and 30 seconds. Quick start-ups are useful where light is only needed for short periods, such as in stairwells.

■ **LIGHT OUTPUT** Stated in lumens (lm). It may appear with wattage (W) on the energy label, but if not, both should be elsewhere on the box, with lumens in a larger font. Use lumens, not wattage to compare light output as energy-saving bulbs produce more light (lm) with less power (W).

■ **LAMP LIFETIME** Usually given in hours. 1,000 hours is roughly one year's use. Manufacturers' claims about the lifetimes of the different types of energy saver can range from two to 20 years.

■ **COLOUR TEMPERATURE** Displayed in kelvin (K). A traditional incandescent bulb measures 2700K. Values close to this or lower should give a warmer glow and those around 3500K and above should look colder. However, perception of this does vary.

■ **SWITCHING CYCLES** The number of times a lamp can be switched on and off – a cycle is typically one minute on, three minutes off. In the Which? test, lamps are switched on for three minutes and off for five minutes, 20,000 times.

■ **DIMMING** If a lamp is unsuitable for use with dimmers or with some types of dimmer, this should be mentioned on the packaging.

As well as CFLs, Which? has tested a range of halogen energy savers. They are supposed to last 2,000 hours – not as long as CFLs and they're less energy-efficient – but are still cheaper to use than traditional bulbs and with a similar light quality, which some may prefer.

Longer-lasting bulbs

Incandescent bulbs are expected to last 1,000 hours. Halogen energy savers last twice as long, CFLs between 6,000 to 15,000 hours and LEDs around 20,000 hours.

Maximum light output

We measure light output after 100 hours in our tests and found that more than 75% of bulbs produced a maximum output within 10 lumens of that claimed on the packaging.

Disposing of CFLs

CFLs contain a small amount of mercury so shouldn't be thrown in the bin. To find out how to dispose of used CFLs, go to our interactive tool at www.which.co.uk/recyclingtool

BEST BUY CFL BULBS

The Best Buy 86% **GE Biax Extra Mini 15W** and 20W lamps were the best and fared well in our lifetime test. The Best Buy 79% **Philips Tornado Turbo Energy Saver 20W** bulb doesn't dim over its lifetime as much as many others, and the Best Buy 75% **Megaman GSU111d Dimmerable** bulb – available at independents – should be usable with most types of dimmer switches. It may not be suitable for hallways though, as the light doesn't come on as soon as you turn it on. However, in our tests it reached almost 60% of its maximum light output within three seconds, which is good for a CFL.



LED-ing lights

LED bulbs are pricey, but supposedly have long lives, save energy and are easier to dispose of than CFLs. Our early tests show that they start up quickly. Light quality is an improvement on CFLs, but not as good as traditionals or halogens.

Before switching to LEDs though, note that they have low light output. The Philips and Pharox LEDs we are testing have outputs of between 200lm and 300lm – that's less than an 8W CFL. But we hope to see improvements in LED technology in the future bringing us brighter LED bulbs.

	SPECIFICATION		WHICH? TEST PERFORMANCE								SCORE (%)	
	PRICE PER BULB (€)	WATTAGE	CLAIMED LIFETIME (HRS)	LIGHT OUTPUT	START-UP	LIFETIME	DIMMING OVER LIFETIME	TEMPERATURE	COLD ON AND OFF	SWITCHING		
CFLS												
1	GE Biax Extra Mini	6.42	15	3U	15,000	★★★★★	★★★★	★★★★★	★★★	★★★★	★★★★★	86
2	GE Biax Extra Mini	8.99	20	3U	15,000	★★★★★	★★★★	★★★★★	★★★	★★★★	★★★★★	84
3	PHILIPS Tornado Turbo Energy Saver	4.99	20	S	8,000	★★★★	★★★	★★★★★	★★★★	★★★★	★★★	79
4	MEGAMAN GSU111d Dimmerable	11.15	11	G	10,000	★★★★	★★★★	★★★★★	★★★	★★★★	★★★★★	75
5	MEGAMAN Ultra Compact Candle	6.98	9	C	10,000	★★★★★	★★	★★★★★	★★	★★★★	★★★★★	61
6	IKEA Sparsam GA607	2.50 ^a	7	G	10,000	★★★	★	★★★★★	★★★	★★★★	★★★★★	59
7	GE Ecomagination Energy Saving GLS 40155	3.98	20	B	6,000	★★★★★	★	★★	★★	★★★★	★★★★★	56
8	MEGAMAN Ultra Compact Candle	5.98	7	C	10,000	★★★★★	★	★★★★★	★★	★★★★	★★★★★	54
HALOGEN ENERGY SAVERS												
1	IKEA Halogen Low Energy Bulb 53W	1.50 ^a	53	B	2,000	★★★★★	★★★★★	★★★★★	★★★★	★★★★★	★★★★★	71
2	PHILIPS EcoClassic 30 Dimmable	1.89	42	B	2,000	★★★★★	★★★★★	★★★★★	★★★	★★★★★	★★★★★	68
3	OSRAM Halogen Energy Saver Classic 28W	1.66	28	B	2,000	★★★★★	★★★★★	★★★★★	★★★★	★★★★	★★★★★	63

^a Bulb comes in a pack of two – price stated is for one bulb.

Using the table

Specification
Price See p29. **Shape** Traditional bulb (B), stick with three (3U), or four (4U) tubes, globe (G), spiral (S), candle (C).

Test Performance
Light output How closely the bulb meets the

manufacturer's claims. **Start-up** Measured at three, 10 and 30 seconds with more emphasis on the three second measurement. **Lifetime** Number of hours the bulb remains lit for (up to 8,000 for CFLs and up to 2,000 for halogens). **Dimming over lifetime** The decrease in light output after 3,000 and

8,000 hours for CFLs and after 2,000 hours for halogens. **Cold temperature** How quickly the bulb gives out light and how much light is given out in colder ambient temperatures. **Switching on/off** We switched bulbs on and off 20,000 times. The higher the rating, the more switches that they lasted for.

Score
 Ignores price, based on:
 Overall light output, construction and information 40%
 Durability 35%
 Start-up 20%
 Cold temp performance 5%



WANT TO KNOW WHICH LAMP WILL BE LIGHTEST ON YOUR POCKET? There are many more bulbs to choose from online at www.which.co.uk/energysavingbulbs. See www.which.co.uk/bulbconcerns for information on phase-out dates of the traditional incandescent bulbs.