

ADVICE



How to Choose Energy-efficient Lighting Options

by Sheri Radford / Nov 18, 2020

We shine a spotlight on an illuminating topic: the three types of energy-efficient light bulbs

Why all the fuss over a simple light bulb? Incandescent light bulbs have been around since the 1800s, but they consume a lot of energy and break easily, so countries around the world have been phasing them out for several years. [Three main types of energy-efficient alternatives](#) have emerged: halogen, LED (light emitting diode) and CFL (compact fluorescent light). Let's see how they compare to each other.

Energy consumption

To produce as much light as a 60-watt incandescent bulb, a halogen requires about 42 watts of energy, a CFL needs 15 watts and an LED needs just 12 watts. Note: The amount of power used by a bulb is measured in watts, and the amount of light produced by a bulb is measured in lumens.

Lifespan

A halogen bulb has an expected lifespan of about 3,000 hours, while a CFL bulb lasts about 10,000 hours. The LED is the undisputed champion here, with an average lifespan of 25,000 hours. This makes LEDs the practical choice in areas where lights must remain on for hours or days at a time, such as in a public parking garage.

Brightness

All three types of energy-efficient bulb can produce the brightness required in a typical home (about 500 lumens) or outdoors (about 1,000 lumens). Where the bulbs differ, though, is in how long it takes to achieve that level of brightness. Halogens and LEDs light up immediately, but it takes a bit longer for CFLs to reach full brightness. Also, even after fully bright, CFLs often flicker.

Colour temperature

Colour temperature is a confusing concept to many people. It's measured in degrees of kelvin ranging from 1,000 to 10,000, but warm lighting is on the lower end of the scale (2,000 to 3,000 kelvin), and cool lighting is on the higher end (4,500 kelvin and above). We're accustomed to the warm, yellowish hue of incandescent bulbs, which is ideal for the cozy, relaxing feel of ambient lighting but not as effective for task lighting. Halogen bulbs tend to have a similar feel, on the warm end of the scale, while CFLs and LEDs can range from warm to cool. For detailed tasks, the most effective lighting is cool and whitish-blue in colour.

Dimming

Energy-efficient bulbs have come a long way in the last few years regarding their compatibility with dimmer switches. Some CFLs now work with dimmer switches, as do many LEDs—always read the packaging carefully to check. Halogens, which use technology very similar to that of traditional incandescent bulbs, can be dimmed.

Price

All three types of energy-efficient bulb may seem expensive to purchase, but over their lifespans they make up for these high up-front price tags. [According to power authority BC Hydro](#), a halogen has an annual energy cost of \$4.32, as compared to \$1.34 for a CFL. The LED is the true superstar, with an energy cost of just \$0.93 annually. Plus, the cost of purchasing LED bulbs keeps dropping dramatically.

Risks & dangers

Halogens emit so much heat that they can cause burns, be a fire hazard and feel uncomfortable to work under for an extended period of time. In addition, halogens are so sensitive to the oils in human skin that the small amount of oil left on a halogen bulb by bare hands occasionally causes a bulb to explode when heated.

CFLs have been linked to eye strain, migraines and elevated stress levels. If a CFL bulb breaks, the small amount of mercury sealed within the glass tubing can escape as mercury vapour, which is toxic to humans and pets. The affected room must be evacuated and aired out for several minutes before any cleanup is attempted. Also, because of this mercury content, CFLs cannot be disposed of in household garbage. Used or broken CFLs must be brought to the appropriate recycling area.

The blue light emitted by LEDs has been linked to disturbed sleep patterns and an increased risk of health conditions such as diabetes, heart disease, obesity and cancer. Some studies have also shown that [LED radiation is bad for our eyes](#), ranging from simple eyestrain to conditions as serious as retinal damage and age-related macular degeneration.

Conclusion

Which type of energy-efficient bulb should you choose? There's no one-size-fits-all answer to that question. In all likelihood, your home, office and outdoor areas need different types of bulbs in different locations to achieve different effects. And as lighting technology continues to evolve and improve, your selections might change over time.

It's clear, though, that of the three energy-efficient bulb choices available on the market today, LEDs have the longest lifespan, cost the least to run each year and are the most energy-efficient. LEDs come in a range of hues, and many of them now work with dimmer switches. Overall, they're the most versatile of the three options.

A note about natural light

The most eco-friendly option of all is the one Mother Nature created: sunlight. It costs nothing, it boosts vitamin D, it helps to ward off seasonal depression and it improves sleep quality. As much as possible, natural light should be used for illumination in the home and office, along with strategically placed mirrors to boost this light.

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