

SAVE MONEY ■ SAVE TIME ■ SAVE ENERGY



# Lighting

your home



The quantity and quality of light around us determines how well we see, work, and play. Light affects our health, safety, morale, comfort, and productivity.

To better understand and use lighting efficiently, here are a few terms you should know as you make your way through this booklet.

## Lighting terminology

**Watt:** A measurement of the amount of energy needed to power a bulb. An LED bulb uses about 9 watts of power to generate the same amount of light as a 60-watt incandescent bulb.



**Lumen:** Measure of a bulb's light output. A 1600-lumen bulb produces the same amount of light as a 100-watt incandescent bulb.

**Color temperature:** The color of light is measured on the Kelvin (K) temperature scale.

- Lower Kelvin temperature light (2,700-3,000 K) is classified as warm and appears more yellow to match incandescent.
- Higher Kelvin temperature light (3,600-5,500 K) is classified as cool and appears more white or blue.
- A color temperature of 2,700-3,600 K is recommended for general indoor use.

**Color rendition:** How colors appear when illuminated by a light source is referred to as color rendition. Color rendition is measured on the Color Rendition Index (CRI) with a scale of 1-100. A CRI of 80 or higher is best for most indoor applications.

## Types of lighting

- **Standard incandescent** bulbs use a coil of tungsten wire that glows when heated by an electrical current – the same technology developed by Thomas Edison more than 100 years ago. Incandescent bulbs are the least expensive to buy, but are the most expensive to operate.



- **Tungsten halogen** bulbs are actually a form of incandescent bulbs. They are filled with gas and have a coating on the inside to reflect heat. They are more energy efficient than standard incandescent bulbs.



- **Fluorescent** bulbs produce light from an electrical current running through a mixture of mercury and inert gases. They are 3 to 4 times more efficient than incandescent bulbs and last up to 10 times longer. Compact fluorescent light (CFLs) bulbs are available in many sizes and styles.



- **Light emitting diode (LED) bulbs** are a type of solid state lighting that uses a semi-conductor to convert electricity into light. ENERGY STAR® are super energy efficient and long lasting; up to 50,000 hours. That's 12 hours a day for 12 years!



## Incandescent vs. LED: Battle of the bulbs

The standard incandescent bulbs in your home cost the least to purchase, but the most to operate. A typical standard incandescent produces only 8-22 lumens per watt of electricity used, which means you have to use higher wattages to achieve the illumination you need. Ninety percent of an incandescent's energy use is wasted as heat.

Replace the five most frequently used bulbs in your home with ENERGY STAR®-qualified LEDs and save more than \$70 every year in energy cost. Typical uses include:

- Family or living room lamps
- Kitchen ceiling light
- Dining room fixture
- Bedrooms lamps
- Porch lights





There is a LED to replace almost any incandescent bulb style including globes, floods, 3-way, dimmable, candelabra and standard models.

### **LED bulbs light the way of the future**

ENERGY STAR® qualified LED bulbs are the most energy-efficient type of bulb. They use only about 9 watts of power and can last for years. LEDs are also durable, cooler-running and are unaffected by cold weather. LEDs are becoming more affordable and wide spread. One area LEDs are making significant gains is with holiday lighting. Check out more information under *Holiday Lighting* starting on page 7.

### **Lighting controls**

Lighting controls are the devices we use to turn lights on and off. The most common control is a standard wall switch. They're simple and functional but require a person to activate them. As a result, unneeded or unused lights can easily be left on, consuming excess electricity.



## Photocells and timers

Photocells turn lights on and off in response to light levels. They can switch outdoor lights on at dusk and off at dawn, automatically saving electricity during the middle of the day when outdoor lighting isn't necessary. Mechanical or electronic timers can be set to turn lights on and off on a particular schedule. You might plug a table lamp into a mechanical timer while you are on vacation so that the lights turn on and it appears someone is home.

## Motion detectors

Occupancy sensors/motion detectors activate lights when there is movement in a specific area and turn them off after motion has ceased. They are most often used where lighting is necessary only when someone is present. They are becoming increasingly popular for homeowner use in basements, garages and stairways.



## Dimmers

Dimmers reduce the wattage and output of incandescent and fluorescent lamps. They allow you to vary the intensity of lighting and the amount of electricity used according to your needs. Not all LEDs are compatible for use with a dimmer. Look for bulbs specifically rated for dimmer use.

Dimming bulbs also increases their service life and reduces energy use. However, if you plan to use a dimmer all the time on specific light fixtures, such as a dining room chandelier, you might consider replacing the bulbs with lower wattage bulbs without using a dimmer.

# Holiday lighting

The new superhero of holiday lighting is the LED bulb. LEDs use 90% less energy, last 10 times longer and feature superior durability when compared to the traditional incandescent bulb.



Although the initial expense of LED bulbs is higher, the price has been dropping every year. Because LEDs last many years longer than incandescent bulbs, they are more economical over time.

When compared head-to-head, it's easy to see the energy-saving advantage of LED bulbs.

## Operating costs for holiday lighting

Lighting	Watts of Electricity (when in use)	Hours per month	Average cost Per month (\$.15/kWh)
Holiday lights (mini incandescent, 70/string)	28	120	\$0.50
Holiday lights (mini LED, 70/string)	2.8	120	\$0.05
Holiday lights (medium C7) (incandescent, 25/string)	50	120	\$0.90
Holiday lights (medium C7 LED, 25/string)	1.25	120	\$0.02

\*Calculated using average rate of 15 cents per kWh



If you just can't bear to give up your traditional holiday bulbs, choose five watt bulb rather than seven watt bulbs and you will still reduce your operating costs by 30%.

Plugging indoor lights into an automatic timer is another way to save on your holiday energy use. No need to remember to turn off the lights when you leave the house or go to bed! Connect lighted outdoor decorations to a photocell to automatically turn them on in the evening and off during daylight hours.





## Holiday decorating safety

Many home electrical fires that occur during the holidays are caused by lights, extension cords, and candles.

Keep your holidays happy and safe by remembering the rules of electrical safety and taking these precautions:

- Make sure all your lights and lighted decorations are safety certified. Look for a label that says *Underwriters Laboratory Approved* or *UL Listed*.
- Keep a fire extinguisher handy and make sure smoke detectors are in working order.
- Candles are the source of many holiday fires. If you must use them, use them carefully.
- Check all holiday lighting for cracked or loose sockets, exposed wires, or frayed or broken insulation before plugging them in. Place the lights on a non-flammable surface and plug them in for 10-15 minutes to check for any defects. Discard any strings that show flaws.
- Protect children and pets by using plastic safety covers on all unused outlets, and keeping cords out of sight and out of reach. Cords pose risk of strangulation for children left unattended.



- Water *real* holiday trees every day to prevent them from drying out and becoming fire hazards. If you have an artificial tree, make sure it is fire resistant.
- Make sure lighted decorations and extension cords used outside are certified for outdoor use and plugged into a ground fault circuit interrupter (GFCI) outlet. Keep electrical connections off the ground.
- Follow manufacturer's guidelines on how many strings of lights can be safely connected together.
- Don't leave lights on while you're asleep or away from home.
- Don't use metal staples or nails as fasteners for lights. This can damage the protective insulation covering the wires.
- Don't run extension cords across sidewalks or driveways.
- When putting up your outdoor decorations, watch for overhead power lines and use extra caution when using a ladder in snowy or icy conditions.





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- Lighting Your Home
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