

## What & Why

# LED Lights?

**LEDs (Light Emitting Diodes)** are solid light bulbs which are extremely energy-efficient. When first developed, LEDs were limited to single-bulb use in applications such as instrument panels, electronics, pen lights and, more recently, strings of indoor and outdoor Christmas lights.

Manufacturers have expanded the application of LEDs by "clustering" the small bulbs. The first clustered bulbs were used for battery powered items such as flashlights and headlamps. Today, LED bulbs are made using as many as 180 bulbs per cluster, and encased in diffuser lenses which spread the light in wider beams. Now available with standard bases which fit common household light fixtures, LEDs are the next generation in home lighting.

**The chart below shows the amount of brightness in lumens you can expect from different wattage light bulbs. The LED bulbs require much less wattage than the CFL or Incandescent light bulbs, which is why LED bulbs are more energy-efficient and long lasting than the other types of bulb**

Incandescent Watts	CFL Watts	LED watts	Lumens (brightness)
40	8 - 12	6 to 9	400 - 500
60	13 - 18	8 - 12.5	650 - 900
75 - 100	18 - 22	13+	1100 - 1750
100	23 - 30	16 - 20	1800+
150	30 - 55	25 - 28	2780

## Why LED Lights?

**Durable** - since LEDs do not have a filament, they are not damaged under circumstances when a regular incandescent bulb would be broken. Because they are solid, LED bulbs hold up well to jarring and bumping.

**Cool** - these bulbs do not cause heat build-up; LEDs produce 3.4 btu's/hour, compared to 85 for incandescent bulbs. Common incandescent bulbs get hot and contribute to heat build-up in a room. LEDs prevent this heat build-up, thereby helping to reduce air conditioning costs in the home.

**Mercury-free** - no mercury is used in the manufacturing of LEDs.

**More efficient** - LED light bulbs use only 2-17 watts of electricity (1/3rd to 1/30th of Incandescent or CFL). LED bulbs used in fixtures inside the home save electricity, remain cool and save money on replacement costs since LED bulbs last so long. Small LED flashlight bulbs will extend battery life 10 to 15 times longer than with incandescent bulbs.

**Cost-effective** - although LEDs are initially expensive, the cost is recouped over time and in battery savings. LED bulb use was first adopted commercially, where maintenance and replacement costs are expensive. But the cost of new LED bulbs has gone down considerably in the last few years, and are continuing to go down. Today, there are many new LED light bulbs for use in the home, and the cost is becoming less of an issue

**Light for remote areas and portable generators** - because of the low power requirement for LEDs, using solar panels becomes more practical and less expensive than running an electric line or using a generator for lighting in remote or off-grid areas. LED light bulbs are also ideal for use with small portable generators which homeowners use for backup power in emergencies.

Energy Sustainability begins with conservation and energy savings LED Lighting applications will reduce wasteful energy by 50%-90% compared to other conventional lighting products. Unlike traditional lighting products, LEDs do not contain Mercury, a potentially hazardous substance that poses a threat of environmental damage. LED Lights not only consume a fraction of the energy consumed by traditional lighting, it provides a double benefit of being longer lasting and environmentally friendly. LEDs are highly rugged and feature no filament that can be damaged due to shock and vibrations. The operational life of LEDs last 4 to 40 times longer than traditional lighting products, while maintaining consistent light output over life. The key strength of LED lighting is reduced power consumption. LEDs approach 80% efficiency; which means 80% of the electrical energy is converted into light energy. LED allows for more precise, purposeful light and reflects properties otherwise unseen, while providing improved uniformity and visibility. While the initial cost of LED lights is higher, cost savings of LED occurs over time by taking advantage of their longevity. Conventional lighting products true cost is the enormous maintenance cost.