



## Holiday Lights

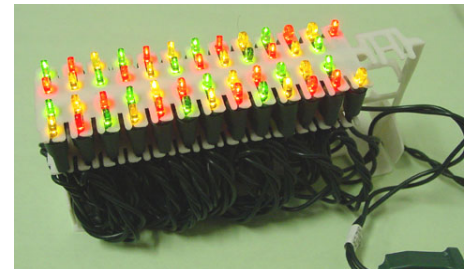
*Many Americans love to decorate during the holidays with strings of lights, and most people currently use standard incandescent (C-7) lights or mini-lights. However, these use a significant amount of energy and regularly involve costly bulb replacement. It often seems easier and cheaper to throw away a string of lights and buy a new one, rather than buy replacement bulbs and figure out which bulbs are burned out.*

There **are** better ways to decorate your home or business. The following is a closer look at two of these. LED and fiber optic trees are the newest additions to the ever-growing types of holiday lighting now available.

### LED Lights

Light Emitting Diode (LED) holiday lights are a new application for a mature technology. LED lights have a number of benefits over conventional lighting:

- ◆ **Energy-efficient** (0.04 watts per bulb; mini-lights use ten times more energy and standard (C-7) bulbs use 100 times more energy)
- ◆ **Long life span** (up to 100,000 hours used indoors, half that outdoors, and the manufacturer provides a 5-year warranty)
- ◆ **Safety** (no chance of combustion from the cool temperature bulbs)
- ◆ **Sturdy bulbs** (the epoxy lenses are virtually indestructible)



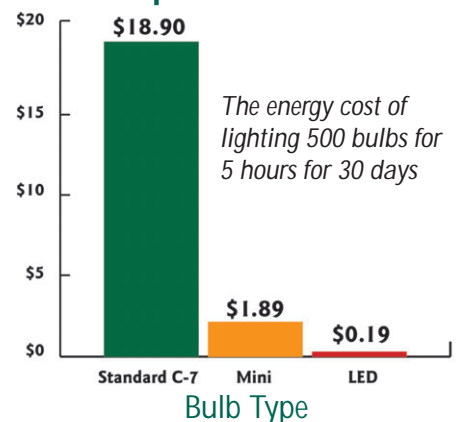
LED holiday lights

- ◆ **Easily strung** (up to 25 strings can be connected end-to-end without overloading a typical household's electrical circuit)
- ◆ **Lamp Replacement** (if a bulb does burn out, the other bulbs will stay lit, so you can easily replace the bad bulb)

LED lights are currently available in 50- and 100-bulb strings with red, green, and yellow bulbs (pictured above); blue and white strings are expected out soon.

**Replacing standard holiday lights with LED lights reduces energy by 99% and reduces the time spent hassling with burned-out bulb replacement.**

### Cost Comparison



## Fiber Optic Artificial Trees

A new product for consumers is the fiber optic artificial tree that have fiber optics built in. These trees use a low-wattage incandescent bulb ranging from 5 to 20 watts, depending on the size of the tree. Light is transmitted from a single bulb (so there's only one bulb to replace) through hundreds of very small fibers and emitted along each branch of the tree. Some trees come equipped with a rotating color wheel that changes the color emitted from the fibers.



Fiber Optic Tree

*Close up of fiber optics*

### Conclusion

Even though the five-year cost of LEDs is more than that of mini-lights, there are several good reasons to purchase LED lights anyway. These include avoiding the hassle and cost of replacing burned-out bulbs, supporting a new technology that uses much less energy, and avoiding adding more plastic to the landfill each year. If you want to purchase an artificial tree, you would do well to consider purchasing a fiber optic model. If you are considering other holiday lighting options, consider both purchase and energy costs.

Fiber optic lights are cool to the touch, as only light is transmitted from the fiber and not heat. The incandescent light source is located in the base of the tree with ventilating holes that must not be covered. The cost for such trees ranges from \$20 for a 2-3-foot tree to over \$200 for the largest trees. Fiber optics are also now used in decorations such as Santa or Angel figures.

## Holiday Lighting Costs

Light Type	Purchase Cost	Energy Use (W)	Total 5-yr Cost
Standard C-7	\$55	500	\$134
Mini Lights	\$9	120	\$24
LED Lights	\$30	12	\$31
Fiber Optic Lights*	n/a	20	\$1

### Assumptions:

- ◆ Because standard incandescent bulbs are much larger and brighter, fewer are needed for a display. This table assumes an 8-foot tree with three 100-bulb strings of mini or LED lights, or five 25-bulb strings of C-7 lights. More lights are typically used in outdoor displays.
- ◆ 6.3 cents per kWh.
- ◆ Prices and quality vary widely among holiday lighting products, especially for mini-lights. The prices shown above and the assumed replacement period of 2.5 years for mini- and C-7 lights represent the experience of the authors with holiday lighting products sold in this area. The purchase costs shown above are the number of strings assumed rather than for a single string.
- ◆ Lighting is operated 5 hours/day, 30 days per year.
- \* Cost shown for fiber optic lights is for energy use only, since the cost of lighting and tree cannot be separated.

## Retail Sources

Albertsons  
Rite Aid  
True Value Hardware  
Ace Hardware

### Some retail establishments carrying Fiber Optic Trees:

K Mart  
Wal-Mart  
Target  
Ace Hardware  
True Value Hardware  
Lowe's  
Coast-to Coast Hardware  
and many on-line companies

## Additional Information

<http://www.foreverbright.com/>  
<http://www.ccl-light.com/main.shtml>  
<http://www.cityofseattle.net/light/conserve>  
<http://www.spectaculartree.com/index.html>

More information on energy efficient lighting is available from the Energy Ideas Clearinghouse, [www.EnergyIdeas.org](http://www.EnergyIdeas.org) and the Lighting Design Lab, [www.lightingdesignlab.com](http://www.lightingdesignlab.com).

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