1.9 ENERGY EFFICIENT LAMPS

Electric lighting burns up to 25% of the average home energy budget. The electricity used over the lifetime of a single incandescent bulb costs 5 to 10 times the original purchase price of the bulb itself. Light Emitting Diode (LED) and Compact Fluorescent Lights (CFL) bulbs have revolutionized energy-efficient lighting. CFLs are simply miniature versions of full-sized fluorescents. They screw into standard lamp socket s, and give off light that looks similar to the common incandescent bulbs - not like the fluorescent lighting we associate with factories and schools. LEDs are small, very efficient solid bulbs. New LED bulbs are grouped in clusters with diffuser lenses which have broadened the applications for LED use in the home. LED technology is advancing rapidly, with many new bulb st yles available. Initially more expensive than CFLs, LEDs bring more value since they last longer. Also, the price of LED bulbs is going down each year as the manufacturing technology continues to improve.

BCFL Lighting: Benefits

Efficient: CFLs are four times more efficient and last up to 10 times longer than incandescents. A 22 watt CFL has about the same light output as a 100 watt incandescent. CFLs use 50 - 80% less energy than incandescents.

Less Expensive: Although initially more expensive, you save money in the long run because CFLs use 1/3 the electricity and last up to 10 times as long as incandescents. A single 18 watt CFL used in place of a 75 watt incandescent will save about 570 kWh over its lifetime. At 8 cents per kWh, that equates to a $45 savings.

Reduces Air and Water Pollution: Replacing a single incandescent bulb with a CFL will keep a half-ton of CO2 out of the atmosphere over the life of the bulb. If everyone in the U.S. used energy-efficient lighting, we could retire 90 average size power plants. Saving electricity reduces CO2 emissions, sulfur oxide and high-level nuclear waste.

High-Quality Light: Newer CFLs give a warm, inviting light instead of the “cool white” light of older fluorescents. They use rare earth phosphors for excellent color and warmth. New electronically ballasted CFLs don’t flicker or hum.

Versatile: CFLs can be applied nearly anywhere that incandescent lights are used. Energy-efficient CFLs can be used in recessed fixtures, table lamps, track lighting, ceiling

fixtures and porchlights. 3-way CFLs are also now available for lamps with 3-way settings. Dimmable CFLs are also available for lights using a dimmer switch

Choosing a CFL

CFLs come in many shapes and sizes. When purchasing CFLs, consult the seller for recommendations and consider the following: Choose your preferred light quality CFL bulbs have a Kelvin or 'K' number listed on the packaging. CFLs with K numbers between 2700-3000 give off a soft bright light like incandescent. CFLs with K numbers between 3500-6000 give off a bright light. As you go up the K number scale the light gets bluish and closer to daylight.

For example:

Approx. 2700K = Warm White (looks just like incandescent)

Approx. 5000K = CoolWhite (white/blue, bright light)

Choose the shape. CFLs are available in a variety of shapes to fit a range of lamps and lighting fixtures. See below on this page for the most popular CFL shapes. Match lumens to the incandescent being replaced. Lumens indicate the amount of light being generated. (Watts is a measure of energy use, not light strength.) Lumen output is printed on the bulb package or on the bulb product page if purchasing bulbs online.

CFL Light Bulb Models

CFLs are available in a variety of styles or shapes. Some have two, four, or six tubes. Older models, and specialty models, have separate tubes and ballasts. Some CFLs have the tubes and ballast permanently connected. This allows you to change the tubes without changing the ballast. Others have circular or spiral-shaped tubes. In general, the size or total surface area of the tube determines how much light the bulb produces. The following CFL bulb models come with standard sockets for easy installation in most common household applications.

1. Spiral Lamps

These bulbs are designed as a continuous tube in a spiral shape which has similar outside shape and light casting qualities to a standard incandescent bulb. Spiral CFL bulbs are made in several sizes to fit most common fixtures.

2. Triple Tube Lamps

These CFLs have more tubing in a smaller area, which generates even more light in a shorter bulb. They pack high light output into a very small space and can be used in fixtures designed for incandescent bulbs, such as table lamps, reading lamps, open hanging lamps, and bare bulb applications.

3. Standard Lamps

These are regular CFL spiral lamps which are placed inside a dome cover and fitted with a standard base which fits common lamp sockets. They are designed to give the appearance of the traditional light bulb for consumers looking for the more familiar light bulb appearance. The glass diffuser provides a quality of light similar to the 'soft-white' type of incandescent bulbs.

4. Globe Lamps

This shape is commonly used in bathroom vanity mirrors or open hanging lamps, and bare bulb applications. Bathroom vanities usually require multiple bulbs, which generate radiant heat. The CFL globe will reduce this heat buildup while saving energy. The glass diffuser provides a soft-white light.

5. Flood Lamps

These lamps are designed to be ideal for recessed and track lighting fixtures, indoors and outdoors. They provide diffused, soft, white light, and generate less heat than will an incandescent flood or a halogen bulb. CFL flood lamps are available in varying sizes and wattages.

6. Candelabra

The screw-in torpedo-shape and the small-base of this bulb is designed for smaller light fixtures throughout the house, from chandeliers to sconces. To use a smaller candelabra-based bulb in a regular socket, you can use a socket reducer.

Limitations of CFL lightbulbs

Although CFLs are an excellent source of energy-efficient lighting, they are not always the best choice for all lighting applications. Here are a few limitations to consider:

On/Off cycling: CFLs are sensitive to frequent on/off cycling. Their rated lifetimes of 10,000 hours are reduced in applications where the light is switched on and off very often.

Closets and other places where lights are needed for brief illumination should use incandescent or LED bulbs.

Dimmers: Dimmable CFLs are available for lights using a dimmer switch, but check the package; not all CFLs can be used on dimmer switches. Using a regular CFL with a dimmer can shorten the bulb life span.

Outdoors: CFLs can be used outdoors, but should be covered or shaded from the elements. Low temperatures may reduce light levels - check the package label to see if the bulb is suited for outdoor use.

Retail lighting: CFLs are not spot lights. Retail store display lighting usually requires narrow focus beams for stronger spot lighting. CFLs are better for area lighting.

Mercury content: CFLs contain small amounts of mercury which is a toxic metal. This metal may be released if the bulb is broken, or during disposal. For more information about mercury and CFLs, see below. The principle reason for reduced lifespan of CFLs is heat. CFLs exhibit shorter lifespans in light fixtures and sockets where there is low air-flow and heat build-up such as recessed lighting. For these types of sockets, it is recommended to use specially designed CFLs for recessed lighting or LEDs. Another main reason for reduced lifespan of CFLs is too-frequent on/off cycling. These bulbs should be used where they will be left on for steady periods without being flicked on and off.

Mercury and CFLs

Mercury is a toxic metal associated with contamination of water, fish, and food supplies, and can lead to adverse health effects. A CFL bulb generally contains an average of 5 mg of mercury (about one-fifth of that found in the average watch battery, and less than 1/100th of the mercury found in an amalgam dental filling). A power plant will emit 10mg of mercury to produce the electricity to

run an incandescent bulb compared to only 2.4mg of mercury to run a CFL for the same time. The

net benefit of using the more energy efficient lamp is positive, and this is especially true if the mercury in the fluorescent lamp is kept out of the waste stream when the lamp expires.

Handling and Disposal of CFLs

The mercury in compact fluorescent bulbs poses no threat while in the bulb, but if you break one:

 Open a window and leave the room for 15 minutes or more

 Use a wet rag to clean it up and put all of the pieces, and the rag, into a plastic bag

 Place all materials in a second sealed plastic bag

 Call your local recycling center to see if they accept this material, otherwise put it in your local trash. Wash your hands afterward. Burned out CFLs can be dropped off at Home Depot and Ikea stores. Another solution is to save spent CFLs for a community household hazardous waste collection, which would then send the bulbs to facilities capable of treating, recovering or recycling them. For more information on CFL disposal or recycling, you can contact your local municipality.