

Compact Fluorescent Lightbulbs



It's great that so many people are using the new Compact Fluorescent Light Bulbs (CFL's) on the market these days. They use less than a quarter of the electrical power that conventional incandescent light bulbs use for the same amount of light and they last as much as 10 times longer. However, several questions have been raised regarding the safety and operation of these products.

Mercury Exposure:

One expressed concern is that of the presence of mercury in CFL's. It is true that CFL's contain a small quantity of mercury. But let's compare that with the mercury content of a few other common household articles. Most CFL's nowadays contain approximately 5 milligrams (mg) of mercury. That's about the size of a pencil dot. By comparison, a standard four-foot long T8 fluorescent lamp (1 inch diameter) has about 10 mg of mercury and the old style T12 fluorescents (1-1/2 inch diameter) contain as much as 21 milligrams. There are approximately 25 mg of mercury in a standard Watch battery, old style home thermometers have about 500 mg, and old home thermostats contain up to 3,000 mg, as much as 600 CFL's. So, without forgetting that mercury is indeed dangerous, exposure from CFL's is a mere fraction of that from other household items.

As long as the lamp remains unbroken, there is no risk of exposure, since the mercury is sealed inside the glass tube and none is released to the atmosphere. The only risk is if the glass tubing is broken, so treat them carefully when removing them from their wrappers. Always twist a CFL by the base, never by the tubes when installing or replacing them.

If a CFL does break in your home, the danger of mercury exposure is less than that of getting cut by the broken glass shards. Sweep up, DON'T vacuum, all the glass fragments and fine particles and place them in a sealable plastic bag. Wipe the area with a damp paper towel, place the used towel in the plastic bag with the pieces, and seal the bag. Weather permitting, open the windows to air out the room. The same applies if the tubing just cracks, but does not shatter.

Like other hazardous household articles, CFL's should be disposed of properly. To find available disposal services in your area, check www.earth911.org. Enter CFL (or other hazardous waste) and your zip code in the search boxes at the top of the home page and all the collection points within 25 miles of your zip code will be displayed. Also, check with your local waste management agency for disposal options or visit www.lamprecycle.org for guidelines on disposing of any lamp containing mercury. IKEA stores collect spent CFL's and other retailers are investigating similar programs.

If there are no options in your area other than normal garbage collection, place the sealed plastic bag inside another one, seal that also, and place it in your household garbage. However, you must first determine if your waste agency has its garbage incinerated. If so, DO NOT use your garbage collection service for disposing of any mercury containing products. They should NEVER be incinerated.

Most lamp manufacturers are working on reducing the levels of mercury on all their fluorescent lamps. Phillips, for example, has announced two new lines of Extreme Low Mercury CFL's with 1.4 and 2.0 mg respectively. That's between a quarter and half of the current levels on the market. These lamps are identified by labelling on the wrappers.

Comparing Power Plant Emissions for Incandescent Bulbs and CFL's:

Most electrical power in the United States is generated by coal-fired power plants and the greatest source of environmental mercury is the burning of fuel for these plants. Since CFL's use only 25% of the electrical energy for the same amount of light, it follows that only 25% of the electrical power needed for incandescents is needed for CFL's. Consequently, only 25% of the power produced for lighting incandescent bulbs will be needed for CFL's. According to the Sierra Club, 10 mg of mercury are released in power plant emissions over a 5 year period for power production for each incandescent bulb. It is clear that overall, CFL's release far less mercury into the environment than incandescent bulbs.

Relative Power Cost:

Of course, there is the significant power reduction that CFL's bring to your monthly electric bill. Each 60 watt incandescent lamp costs about 4.5 cents more for light for each 10 hours of operation than a 15 watt CFL for the same amount of light. But, in addition to that, there is the issue of the extra heat. Since incandescent bulbs operate by heating a filament to incandescence, most of the energy consumed is emitted to the surroundings as heat. In fact, 90% of the wattage of an incandescent bulb is added as heat to the room where the bulb is located. In the winter this helps to warm the house and reduce the heat provided by the furnace, which is more efficient, by the way, at heating a house than a light bulb. However, in the summer, this heat increases the air conditioning loads needed to cool the house.

If your house is air conditioned and electricity costs 10 cents per kilowatt-hour (about the average for residential electricity around the country these days), every 10 hours of operation of a 60 watt light bulb in the summertime, increases your monthly electric bill just for to extra cooling costs by slightly under 5 cents compared to a CFL. That brings the total savings of CFL's over incandescents to 9.5 cents in summer months for each 60 watt bulb for every 10 hours of use.

Other CFL Issues:

CAN CFL'S BE USED WITH DIMMER SWITCHES, TIMERS, OR PHOTOCELLS? Using a standard CFL on a dimmer is not recommended. It will shorten bulb life and void the warranty. There are CFL's specifically designed to be used with dimmers. They are marked on the label. Some electronic timers and photocells contain components that are incompatible with CFL's. Using these bulbs with incompatible products will shorten the bulb life. To find out if an electronic timer or photocell is compatible with compact fluorescent bulbs, check with the timer or photocell manufacturer.

CAN CFL'S BE USED WITH 3-WAY LAMPS? Standard CFL's will operate on a 3-way lamp, but only in the "medium" (middle) position. Special bulbs for use on 3-way lamps are available. In either case, use in this application will not affect the bulb's performance or life.

WILL CFL'S OPERATE WHEN IT WILL BE TURNED OFF OFTEN OR IN ENVIRONMENTS INVOLVING VIBRATION? CFL's work best if they are left on for at least 15 minutes at a time. This gives them time to thoroughly warm up. Consistently not leaving them on long enough for proper warmup will shorten bulb life. Use of CFL's in vibrating environments is not recommended, since vibration can cause the electronics to fail. An FLE11 bulb is available for use in ceiling fans. Check the package.

CAN CFL'S BE USED IN ENCLOSED FIXTURES? Generally, CFL's can be used in any enclosed lighting fixtures EXCEPT for recessed fixtures such as ceiling can lights. Recessed fixtures do not provide sufficient ventilation for CFL's to operate within their temperature range.

CAN CFL'S BE USED IN ANY POSITION? Unless there is a message on the lamp or packaging that says otherwise, CFL's can be used in any operating position.

WILL CFL'S INTERFERE WITH ELECTRONIC EQUIPMENT? Under rare conditions, CFL's may interfere with the infrared control signals that pass between the handheld remote and the TV, stereo, radio, or other household entertainment device. This is caused by infrared light from the CFL entering the reader of the remote or the device itself and disrupting the control signals. If your device appears to operate erratically, move the CFL to another location or plug the the light or the device into a different outlet.

SHOULD I BE CONCERNED ABOUT THE ULTRAVIOLET LIGHT EMITTED FROM FLUORESCENT BULBS? All fluorescent lamps and bulbs give off a small quantity of UV, but it is much less than a hazardous amount. Far more UV is encountered in natural daylight than is emitted by artificial light sources.

Sources: Koninklijke Philips Electronics N.V., General Electric Company, Home Power Magazine, Sierra Club.