



fast facts

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Compact Fluorescent Lamps

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Environmental issues are a top priority for many organizations. These days, it's hard to watch TV without hearing how businesses and institutions can help the environment by "going green." One increasingly popular way of contributing to the green movement is to install compact fluorescent lamps (CFLs), a fluorescent bulb designed to emit as much light as traditional light bulbs while using less energy. CFLs use about 75 percent less energy than standard incandescent bulbs and can last up to 10 times longer. CFLs also produce about 75 percent less heat, so they're safer to operate and can cut building cooling costs.



Figure 1: Compact Fluorescent Lamp

Fluorescent light bulbs (including compact fluorescents) are more energy-efficient than regular bulbs because of the different method they use to produce

light (Figure 1). Regular bulbs (also known as incandescent bulbs) create light by heating a filament inside the bulb; the heat makes the filament white-hot, producing the light that you see. A lot of the energy used to create the heat that lights an incandescent bulb is wasted. A fluorescent bulb, on the other hand, contains a gas that produces invisible ultraviolet light (UV) when the gas is excited by electricity. The UV light hits the white coating inside the fluorescent bulb and the coating changes it into light you can see. Because fluorescent bulbs don't use heat to create light, they are far more energy-efficient than regular incandescent bulbs.

Fluorescent lamps contain a small amount of mercury vapor - approximately 5 milligrams - sealed within the glass tubing. Mercury, at atmospheric pressure, is a silver colored liquid that tends to form balls. Mercury is a hazardous substance that can be inhaled, absorbed through the skin, and ingested. It is a neurotoxin that can cause - among many additional symptoms - tremors, insomnia, lassitude, weight-loss, and emotional disturbances. Because CFLs contain a small amount of mercury, they should be recycled rather than thrown out in the trash.



Figure 2: Burnt out CFL

Mercury is a critical component of CFLs and is the substance that allows the lamp to turn on. No mercury is released when the lamps are intact or in use, and if the lamp is disposed of properly, mercury in CFLs shouldn't be an environmental, safety, or health hazard.

There are some applications and locations where compact fluorescent lamps cannot be used. Unless specifically allowed, fluorescent fixtures and compact fluorescent lamps cannot be used for emergency lighting systems. Such systems may switch to battery power in an emergency. While incandescent lamps can operate on either AC or DC, the electronics of a CFL lamp may malfunction if DC power is used. Emergency power systems may also not generate the same voltage as normal commercial power, and this can cause ballasts to overheat or malfunction.

Compact fluorescent lamps can't be used in certain life-safety applications. For example, some incandescent lamps must be able to reach immediately their full brightness at all ambient temperatures. These types of lamps should not be replaced with a fluorescent lamp of any type. Currently, it is not recommended that CFLs be used in vibrating environments such as near or part of heavy machinery. Vibration can cause the electronics in the CFL to fail.

When a CFL is broken, wear chemical resistant gloves to clean it up. The gloves can be vinyl, rubber, PVC, or neoprene. The gloves protect your skin from absorbing mercury and from getting cut by the glass. The remains of one lamp can be disposed as normal waste since the amount of mercury is small, but use care when handling and disposing of the broken glass. Mercury-containing lamps are classified as a "Universal Waste" so government facilities must follow federal EPA regulations for storing and disposing of worn-out or broken lamps.

fast stats

- Each year, retailers sell approximately 130-150 million CFLs.
- Older thermometers contain about 500 milligrams of mercury, the equivalent of 100 CFLs.
- Organizations using 50 CFLs (100 watts each) save about \$550/year in electricity costs.
- CFLs must be disposed of in accordance with 40 CFR § 273.13. Go to http://edocket.access.gpo.gov/cfr_2007/JulQTR/pdf/40CFR273.13.pdf for information.

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