

## Compact Fluorescent Lights

Compact fluorescent lights are also known as CFL's. As a compact version of a regular fluorescent tube, they are meant as a direct replacement for incandescent bulbs. The screw in CFLs can be used in conventional lamp sockets. CFLs fit most lighting fixtures and come in a variety of shapes and sizes. Although CFLs have a higher initial cost, the cost to use them is lower than an incandescent bulb. Maintenance requirements are significantly fewer for CFLs because they are rated for a life of 6000 to 10000 hours, while incandescents are rated for 1000 hours. CFLs are mostly recommended for high usage lighting fixtures that are generally used for 3 or more hours per day. The high usage areas generally include hallways, family rooms and outdoor porches or deck areas. They are generally guaranteed for 7 years and can save you around \$45 over the lifetime of the bulb.

### Some of the different types of CFLs include:

*U-bend:* have a long life and are energy efficient fluorescent lamps designed for easy retrofit in existing sockets. These lights might have 2, 3 or 4 tubes that are bent into a U-shape.

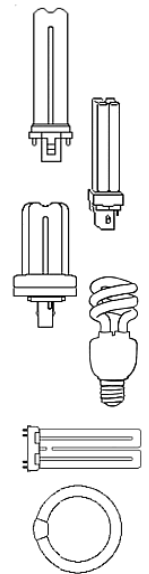
*Spiral:* these provide better light distribution than the U-bend and are great for table lamps.

*Incandescent Shape:* these have a cover over the CFL that distributes the light similar to the A-line incandescent bulb that it is meant to replace.

*Specialty:* these are special CFLs, for example a dimmable or tri-light, which are available for special applications.

*2D:* this is a unique lamp that is used in a variety of specialty fixtures. These lights have a very low profile that allows the fixtures to hug the wall or ceiling to provide modest lighting.

*Circline:* a popular circular fluorescent lamp as a replacement for incandescent bulbs for typical table lamp fixtures.





<u>Wattage</u>		<u>Lumen Output</u>	<u>Lumens per watt</u>	
<u>Incandescent</u>	<u>CFL</u>		<u>Incandescent</u>	<u>CFL</u>
40	9	450	11	50
60	13	800	13	62
75	20	1100	15	55
100	23	1600	16	70

### Incandescent Lighting

Incandescent lights are the most commonly used lights in the home. They are also available in a variety of models and are considered a warm light source and suitable for making living spaces more comfortable by enhancing reds and yellows. The main disadvantages of these lights are that they have a short life and do not use power efficiently. More than 90% of power used by an incandescent bulb is used to produce heat rather than light. They typically last from 1000 to 1500 hours.

### Different Types of Incandescents



*Long life incandescent bulbs* have a longer life because they provide less light per watt than a standard incandescent bulb, which in turn makes them less energy efficient. This type of bulb was meant for areas where they are difficult to change and where not a lot of light is needed.

*Clear standard-sized bulbs* are meant for specialty fixtures such as chandeliers to add some extra shine. They are generally low-voltage and are preferably controlled by a dimmer. These bulbs are not to be used in a fixture that would make them visible because they give a hot spot at the filament which then creates a glare.

*Frosted (IF) bulbs* are white-coated on the inside and diffuse the light evenly, while creating shadows. They are designed for table lamps or in any other place where the bulb would be visible.





*Reflector (R) bulbs* have an interior aluminium coating, which is meant to direct the light forward. These are generally used in recessed fixtures and project a cone of light out of the fixture and down into the room.

*Ellipsoidal reflector (ER) bulbs* focus the light beam two inches ahead of the bulb to reduce the amount of light trapped within the lighting fixture. In a recessed fixture, the ER bulb would be most suitable and would produce more light than an R bulb.

*Tungsten halogen or quartz bulbs* are incandescent bulbs but are just special types. These types of lights are used mostly for display lighting, floor lamps and track lighting.

An incandescent bulb has a lower efficiency because of filament deposits on the bulb, which is the blackening that becomes visible as a bulb nears the end of its life. A halogen bulb has an element that adds to the filling gas, which increases the life and efficiency of the bulb. Halogen lights are described as having crisp white light and natural colors. A reflector is often incorporated into the bulb for better beam control and dispersion. Halogen bulbs are very small and are more energy efficient than standard incandescent bulbs. Halogen bulbs are offered in both line voltage (120V) and low voltage (mainly 12V) designs. There is more ultra violet radiation generated from tungsten-halogen bulbs than from regular incandescent bulbs due to a higher filament temperature. It is important that safety precautions be taken when using these types of bulbs. These bulbs tend to get very hot and must be kept away from potentially flammable materials. It is best that the bulb not be touched directly; the fingerprints can cause bulb discoloration, reduction in light output, short life, or violent failure.





*Fluorescent tubes* much like CFLs, fluorescent tubes provide about four times more light (lumens) per watt than incandescent bulbs. This basically means that one 40-watt fluorescent tube produces the same amount of light as three of the 60-watt incandescent bulbs, and it also lasts about eight times longer. Fluorescent tubes are named after the color of light that they emit. Lamps that are referred to as "cool", are generally used in utility settings (shop areas), or in rooms with green or blue coloring, where mood lighting is important. Lamps that are considered to be "warm" are mostly used in living areas and are a close replication of incandescent lights. Lighting displays will demonstrate the difference between the colors of the lamps and can help determine which is best for any given situation.

### Understanding efficiency

A lumen is a measurement of the amount of light that is produced. The efficiency of a light is defined as the ratio of lumens to watts. What this means in basic terms is that it is a ratio of the measurement of light output to the energy input. The higher the lumens per watt, the more energy efficient the light.

### Controlling Systems

One of the ways to reduce your lighting energy consumption is to have lighting controls to allow lights to be switched off when the area is not in use and on when it is in use.

There are a few different types of controls systems:

*Toggle switches* are the most commonly used control systems for residential use. These are three-way type switches that are usually installed at entrances to rooms, stairways and hallways.

*Dimmer switches* may vary the level of light in order to create moods while saving energy. Dimmer switches are available in both lamp-socket and wall-mounted varieties, which allows them to offer flexible control of light levels and economic operation. If a dimmer switch is set at less than its full bright it will prolong the life of the lamp and conserve energy.





Fluorescent lamps require special dimmers, although special dimmable CFLs can be used with conventional incandescent dimmers.

*Time controls* are 24 hour electric clocks that can be set to switch lights on or off at predetermined times. There are some time controls that will automatically adjust the turn on times according to the season.

*Portable plug-in time switch* can be used to turn a lamp, radio or any table appliance on and off automatically. They are able to turn lights on and off at certain times so that your home appears lived-in or they can turn walk-way lighting on for you.

*Occupancy and motion sensors* are electrical devices that can automatically turn lights on or off in response to the presence or absence of occupants in a space. The best places for these sensors are stairwells, long hallways, laundry rooms or other areas that are visited infrequently and where you are likely to have your hands full. Motion sensors are also well suited for use outdoors to provide security.

*Photoelectric controls* are also referred to as photo-cells and are activated by natural light for automatic dusk to dawn lighting. As it starts to get dark outside the photo-cells will turn the lights on and as it gets light again the lights will go out. These controls are ideal for increasing outdoor safety and security by lighting walkways, driveways, entrances and other areas where continuous night lighting is desirable. These lights are often used with motion sensors ensuring that lights do not come on during daylight hours.

### Lighting for YOU!

When considering lighting systems, some of the light that reaches the target area is reflected from the walls and ceilings. Lighter paint shades reflect more light, while darker paint shades absorb more of the light. Therefore it is very important to choose your room colors carefully, keeping in mind how much the color will reflect within the room. Certain color shades such as green and blue, reflect more light than warm shades such as pink, coral or beige. In order to get the most amount of light possible out of your lighting system consider painting your rooms in light colors. You shouldn't finish your room with a high gloss; the surface could produce a glare, which can lead to visual discomfort and eyestrain.

