CFLs

Cross reference between compact fluorescent lamps and incandescent lamps

Compact fluorescent lamps (CFLs) are available in a variety of shapes. Many of these mimic the shapes of traditional lamps. Others don't but try to have a configuration that will produce the same light pattern as the traditional lamp. An example of this would be the Twist lamp, which tries to be as compact as the standard incandescent lamp.

The table below gives information about the various options for replacing incandescent lamps with compact fluorescent lamps.

Compact fluorescent			Incandescent			Watts Saved	CFL life vs. Inc. life
Wattage/shape	Lumens	Life	Wattage/shape	Lumens	Life		
Standard incandescent lamps (A-base lamp)							
7W minitwist	375	8,000	25/A	160	2500	18	3x
11W minitwist	600	8,000	40/A	465	1500	29	5x
13W minitwist	800	8,000	60/A	850	1000	47	8x
15W twist	850	10,000	60/A	850	1000	45	10x
19W minitwist	1200	8,000	75/A	1170	750	56	11x
20W twist	1200	10,000	75/A	1170	750	55	13x
23W minitwist	1600	8,000	100/A	1690	750	77	11x
23W twist	1450	10,000	90/A	1450	750	67	13x
27W twist	1750	10,000	100/A	1690	750	73	13x
30W twist	2000	6,000	100/A	1690	750	70	8x
40W twist	2600	8,000	150/A	2640	750	110	11x
3-way lamp – comparison shown per stage – CFL is twist shape and incandescent is A-base							
12W	600	6,000	30W	270	1200	18	5x
19W	1100	6,000	60W	860	1200	51	5x
28W	1600	6,000	90W	1130	1200	72	5x
Candelabra							
4 W candelabra	160	6,000	15W candelabra	125	1500	11	4x
Flood lamps							
15W R30	560	8,000	65W R30	620	2000	50	3x
20W R30	900	8,000	75W R30	680	2000	55	4x
Circleline							
30W circ	1800	10.000	100/A	1690	750	70	13x

Lamp data for the above was taken from Sylvania Bulletin # CF026R6.   www.sylvania.com

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Some considerations for choosing the right compact fluorescent lamp:

- **Color:** CFL lamps can come in varying shades of white. This is usually designated by a name, such as Soft White, or a color temperature, such a 2,700 degrees Kelvin (K). The color that best matches an incandescent bulb is Soft White which has a color temperature of 2,700 K. For task lighting, such as over a desk, you might want to consider a slightly cooler color such as Cool White (4,100 K) or Daylight White (6,500 K). These colors have more blue in them which aids the eye in seeing details.

- **Lamp form and function:** If possible, match the form and function to the fixture. Many recessed ceiling fixtures are meant to use reflector lamps. If there is currently an incandescent reflector lamp in the fixture, replace it with a reflector CFL. If you have a three-way lamp holder in which you use a three-way incandescent lamp then replace it with a three-way CFL.

- **Energy Star Certification:** Probably the most important thing to look for is the Energy Star label on the package. This label ensures that the CFL's claims (brightness, longevity, power used, etc.) are true.

Estimating savings over the life of the compact flourescent

The savings from replacing an incandescent bulb with a CFL comes from two places. The first is the difference in life of the two types of bulbs. For example, a 27 W twist CFL lasts for 10,000 hours but costs $3.50. The 100 watt incandescent lamp it replaces lasts for only 750 hours but only costs 59¢. Because of the difference in life, the incandescent bulb will have to be replaced many times before the total operating hours reaches the 10,000 hour life of the CFL. Just how many incandescent bulbs you would have to buy is just the life of the CFL divided by the life of the incandescent bulb.

$$\text{Incandescent bulbs needed to match life of CFL} = \frac{\text{CFL life}}{\text{Inc. life}} = \frac{10,000\,\text{hrs}}{750\,\text{hrs}} = 13.3$$

What these 13 + bulbs are going to cost is 13.3 x 59¢ = $7.85. This means that the $3.50 CFL is actually going to save $4.35 in bulb costs over its life.

The second source of savings is reduced energy use. The incandescent bulb uses 100 watts while the CFL only uses 27 watts for a savings of 73 watts. Over its 10,000 hour life the CFL is going to save 73W x 10,000 hrs =730,000 watt-hours or 730 kilo-watt-hours. If you are paying 9¢ for each kWh then your energy savings are 730 x 9¢ = $65.70.

The total savings is the sum of the savings in bulb costs and the energy savings, $4.35 + $65.70 = $70.05. That's not a bad return on a $3.50 investment.

$$CFL\ Savings = \underbrace{\left(\frac{CFL\ life}{Inc.\ life} \times Inc.\cos t\right) - CFL\cos t}_{\text{Savings in the cost of bulbs}} + \underbrace{Energy\cos t \times \frac{(Inc.\ watts - CFL\ watts)}{1000} \times Life\ of\ CFL}_{\text{Savings in the cost of energy}}$$