

# Compact Fluorescent Lamps - General Information

Compact fluorescent lamps, introduced in the early 1980's, offer an energy-efficient, long-lasting substitute for the incandescent lamp. The excellent color rendition and the wide variety of available sizes, shapes, and wattages make them suitable for many applications, both in new buildings and retrofit situations. While not every incandescent fixture has a fluorescent counterpart, compact fluorescents can be incorporated into most lighting designs that are both aesthetically pleasing and energy-efficient.

## **The Technology**

Compact fluorescent lamps are single-ended with a small diameter tube and multiple bends to achieve their reduced size. The small diameter makes it economical to use a high phosphor coating for improved light output and good color rendering. Like all gaseous discharge lamps, compact fluorescents require a ballast to start the lamp and regulate the voltage during operation.

## **Advantages**

**Higher efficacy:** The term efficacy is used to describe how efficiently a lighting system converts electricity into light. Defined as the ratio of light output to energy input, or lumens per watt (LPW), the efficacy of standard incandescent lamps (8-20 LPW) is due to the fact that much of the energy input is lost in the form of heat. In contrast, typical compacts have efficacies three to four times greater, ranging from 25 to 85 LPW.

**Longer life:** The typical rated life of a compact fluorescent lamp is 10,000 hours, while the rated life of a standard incandescent lamp is only 750-2,000 hours. The longer life of fluorescent lamps offers savings in both material and labor costs for lamp replacement. However, the life of a fluorescent lamp is sensitive to the average operation time per start of the ballast-and-lamp circuit. A fluorescent lamp that is started more often will have a shorter life than one that is started less frequently. Rated life is based on three hours per start throughout this catalog.

**Color:** Nearly all of today's compacts produce light with excellent color rendering properties, similar to incandescent. These lamps are available in several color temperatures to achieve various effects: 2800K lamps achieve a warm "incandescent" atmosphere, 3500K lamps produce a neutral-white light, and 4100K lamps provide a cooler environment.

**Cost savings:** The money saved through less energy use, fewer lamp replacements, and lower labor costs can quickly return the initial investment and provide continuing operating cost savings. Users can expect to save 65-75% in overall lighting costs, which includes the cost of lamps, labor, and energy.

**Qualifications:** Compact fluorescent lamps are excellent choices for many commercial lighting situations, but may not be suitable in high ceiling applications (greater than 12 feet), or where tight control of beam spread is necessary. Also, where dimming is important, compact fluorescents may not be appropriate for some lighting retrofits. New products are, however, filling many of these gaps and are coming out every day.

A concern with all fluorescent lamps is the operating temperature. The starting of small-wattage lamps (less than 10 watts) can be affected when the ambient temperature drops below 40 degrees, limiting some outdoor applications. In addition, excessive bulb wall temperature can significantly reduce the total light consideration when compact fluorescent are used in fixtures that trap heat near the lamp.

To achieve the compact size and low cost of compact fluorescent ballasts, many are produced with a normal power factor (NPF) rating. This causes the ballast to draw more current (amps), but not more energy, than the high power factor type. When using a large number of fixtures in a given location, consult your utility representative or a professional engineer to evaluate power factor and other power quality issues. Some new compact fluorescent products listed in this catalog do have high power factor ballasts and low total harmonic distortion, if it is determined that you need this type of performance. Many lamps operating on NPF magnetic ballasts require one to three seconds to start and rise to full output. Where instantaneous lighting is required, select rapid-start/preheat or electronic ballasts.

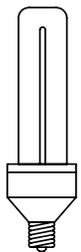
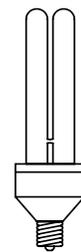
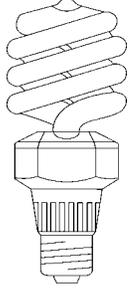
# Incandescent to Compact Fluorescent Replacement

LAMP ABBREVIATIONS	
CF	Compact Fluorescent (Non-Replaceable Lamp)
TT	Twin Tube (Replaceable Lamp)
DTT	Double Twin Tube (Replaceable Lamp)
TTT	Triple Twin Tube (Replaceable Lamp)

This guide was designed to help with the selection of energy efficient replacements of some common incandescent lamps. All of the replacements listed below are compact fluorescent lamp and ballast units of various wattages and sizes. The replacements listed in this chart are based on recommendations published by the manufacturer's of these items. Before retrofitting any incandescent with one of these compact fluorescent lamps it is recommended that the characteristics of the chosen compact fluorescent replacement be carefully reviewed. All of the physical dimensions and operating characteristics for these lamps can be found in the product listing section of this catalog. Additional technical and ordering assistance may be obtained by calling 1-800-DLA-BULB.

FIGURE	LAMP TYPE	WATTS	LAMP TYPE	NSN	FIG. NO.	PG NO.	FIGURE
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INCANDESCENT LAMPS	
	60A
	75A
	90A
	100A

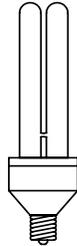
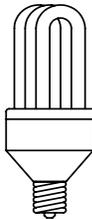
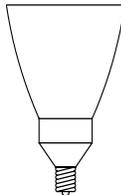
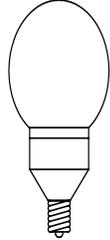
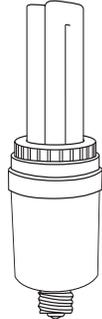
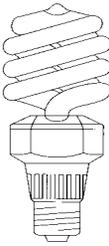
ENERGY SAVING COMPACT FLUORESCENT LAMPS						
10	DTT	6240-01-413-7613	10	27	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">             Twin Tube            Fig. 1         </div> <div style="text-align: center;">             Double Twin Tube            Fig. 2         </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">             Fig. 9         </div> <div style="text-align: center;">             Fig. 10         </div> </div> <div style="text-align: center; margin-top: 20px;">             Spiral Tube            Fig. 11         </div>	
	DTT	6240-01-411-4425	10	27		
11	CF	6240-01-406-9057	2	22		
	CF	6240-01-435-5810	11	31		
13	DTT	6240-01-394-4205	2	22		
	TT	6240-01-344-9543	2	22		
	DTT	6240-01-411-4419	10	27		
	DTT	6240-01-413-7593	10	27		
	DTT	6240-01-413-7612	10	27		
	DTT	6240-01-411-4511	10	27		
15	CF	6240-01-381-4448	2	22		
	CF	6240-01-367-5732	3	22		
	CF	6240-01-352-3642	5	23		
	CF	6240-01-435-5818	11	31		
16	CF	6240-01-381-2036	4	23		
	CF	6240-01-381-2149	5	23		
	CF	6240-01-381-1618	5	23		
17	CF	6240-01-368-6966	5	23		
18	DTT	6240-01-394-4211	2	22		
	CF	6240-01-381-4449	2	22		
	CF	6240-01-367-5733	3	22		
20	CF	6240-01-435-5837	11	31		
	CF	6240-01-367-5734	3	22		
23	CF	6240-01-367-5734	3	22		
25	CF	6240-01-381-4450	2	22		
27	DTT	6240-01-394-4212	2	22		

Figures are not to scale and are shown for illustration purpose only.

# Incandescent to Compact Fluorescent Replacement

FIGURE	LAMP TYPE	WATTS	LAMP TYPE	NSN	FIG. NO.	PG NO.	FIGURE
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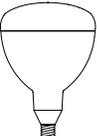
INCANDESCENT LAMPS	
	60A
	75A
	90A
	100A

ENERGY SAVING COMPACT FLUORESCENT LAMPS					
10	DTT	6240-01-413-7613	10	27	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Double Twin Tube</p>  <p>Fig. 2</p> </div> <div style="text-align: center;"> <p>Triple Twin Tube</p>  <p>Fig. 3</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p>Fig. 4</p> </div> <div style="text-align: center;">  <p>Fig. 5</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p>Fig. 10</p> </div> <div style="text-align: center;">  <p>Fig. 11</p> </div> </div>
	DTT	6240-01-411-4425	10	27	
11	CF	6240-01-406-9057	2	22	
	CF	6240-01-435-5810	11	31	
13	DTT	6240-01-394-4205	2	22	
	TT	6240-01-344-9543	2	22	
	DTT	6240-01-411-4419	10	27	
	DTT	6240-01-413-7593	10	27	
	DTT	6240-01-413-7612	10	27	
	DTT	6240-01-411-4511	10	27	
15	CF	6240-01-381-4448	2	22	
	CF	6240-01-367-5732	3	22	
	CF	6240-01-352-3642	5	23	
	CF	6240-01-435-5818	11	31	
16	CF	6240-01-381-2036	4	23	
	CF	6240-01-381-2149	5	23	
	CF	6240-01-381-1618	5	23	
17	CF	6240-01-368-6966	5	23	
18	DTT	6240-01-394-4211	2	22	
20	CF	6240-01-381-4449	2	22	
	CF	6240-01-367-5733	3	22	
	CF	6240-01-435-5837	11	31	
23	CF	6240-01-367-5734	3	22	
25	CF	6240-01-381-4450	2	22	
27	DTT	6240-01-394-4212	2	22	

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# Incandescent to compact Fluorescent Replacement

FIGURE	LAMP TYPE	WATTS	LAMP TYPE	NSN	FIG. NO.	PG. NO.	FIGURE
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INCANDESCENT LAMPS	ENERGY SAVING COMPACT FLUORESCENT LAMPS				
 <p>50R FLOOD</p>	5	TT	6240-01-413-7233	7	24
			6240-01-413-7235	7	24
			6240-01-413-7234	7	24
			6240-01-411-3127	7	24
			6240-01-411-3145	7	24
			6240-01-411-3149	7	24
			6240-01-413-7225	7	24
			6240-01-413-7223	7	24
			6240-01-413-7224	7	24
			6240-01-411-2578	7	24
			6240-01-411-3023	7	24
			6240-01-411-3073	7	24
			6240-01-413-7274	7	24
	6240-01-413-733555	7	24		
	6240-01-413-7336	7	24		
	6240-01-411-3155	7	24		
	6240-01-411-3605	7	24		
	6240-01-411-3608	7	24		
	6240-01-413-7227	7	24		
	6240-01-413-7226	7	24		
	6240-01-413-7228	7	24		
	6240-01-411-3078	7	24		
	6240-01-411-3083	7	24		
	6240-01-411-3097	7	24		
	6240-01-413-7340	7	24		
	6240-01-413-7341	7	24		
	6240-01-413-7463	7	24		
	6240-01-411-3921	7	24		
	6240-01-411-4398	7	24		
	6240-01-411-4396	7	24		
	6240-01-344-9544	6	23		

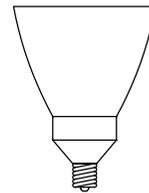


Fig. 6

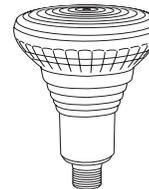


Fig. 7

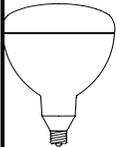
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# Incandescent to compact Fluorescent Replacement

FIGURE	LAMP TYPE	WATTS	LAMP TYPE	NSN	FIG. NO.	PG. NO.	FIGURE
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INCANDESCENT LAMPS	
	75R FLOOD
	100R FLOOD

ENERGY SAVING COMPACT FLUORESCENT LAMPS				
13	DTT	6240-01-413-7337	7	24
		6240-01-413-7806	7	24
		6240-01-413-7338	7	24
		6240-01-413-7339	7	24
		6240-01-411-3613	7	24
		6240-01-411-3616	7	24
		6240-01-411-3619	7	24
		6240-01-411-3899	7	24
		6240-01-413-7229	7	24
		6240-01-413-7230	7	24
		6240-01-413-7231	7	24
		6240-01-413-7232	7	24
		6240-01-411-3112	7	24
		6240-01-411-3115	7	24
6240-01-411-3119	7	24		
6240-01-411-3122	7	24		
15	CF	6240-01-344-9545	6	23
18	TTT	6240-01-419-7722	8	26
		xxxx-xx-xxx-xxxx	8	26
		6240-01-419-7723	8	26
		xxxx-xx-xxx-xxxx	8	26
	CF	6240-01-344-9503	6	23
20	CF	6240-01-409-1823	6	23

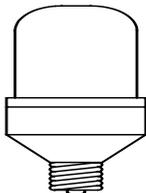


Fig. 6

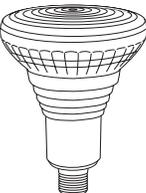


Fig. 7

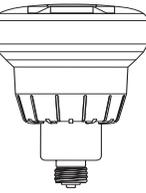


Fig. 8

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