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How can I tell if it is safe to use this compact fluorescent light (CFL) in my light-socket?

The adjoining picture shows the interior of a light-socket. The socket's maximum rating, for incandescent bulbs, is 75 Watts. However, the socket contains a CFL, rather than an incandescent bulb.

What is not immediately obvious is that this particular CFL is providing the lighting equivalent of a 100-Watt incandescent bulb. At first glance, this seems to exceed the socket's capacity. Is there a risk of fire? No, but an explanation would help.

Strictly speaking, the proper measures of lighting are lumens and/or candelas. Incandescent bulbs have been around for a long time. Manufacturers have always used Watts, rather than lumens, to describe lighting-capacity. Most buyers instinctively know much light 60-Watt and/or 100-Watt bulbs produce. However, buyers usually do not understand lumens and/or candelas.

For easy comparison with incandescent bulbs, CFL-manufacturers usually describe their products in Watt-equivalencies. Unfortunately, those Watt-equivalencies often confuse consumers. For example, many consumers might wrongly assume that a CFL with **light-output** equivalent to a 100-Watt incandescent bulb would be too much for this socket. How can consumers be sure about fire-safety?

Look at the package's upper right corner. Note that this CFL consumes only 28 Watts. This is well below the socket's maximum of 75 Watts. The CFL is safe for use in the socket. (*The same information, indicating 28 Watts, is also on the base of the CFL.*)

What are the implications for conservation, and for reducing electricity costs? Obviously, this consumer wants the **light-output** that a 100-Watt bulb can produce. The only remaining question is the amount that she or he wishes to pay for that **light-output**.

Assume that the consumer buys a 100-Watt **incandescent bulb** and operates it 10 hours per day. In one year, the consumer would use 365 kilowatts of electricity [(100 x 10 x 365)/1000 = 365 kilowatts]. If electricity were $0.058 per kilowatt/hour, operating cost would be $21.17. Instead, assume that the consumer buys the 28-Watt CFL. Usage would drop to 102.2 kilowatts of electricity [(28 x 10 x 365)/1000 = 102.2 kilowatts]. With electricity still at $0.058 per kilowatt/hour, operating cost would be only $5.93. In one year, the 28-Watt CFL would have paid for itself. In the remaining four to six years of its life, that CFL would generate savings of $15.24 per year. Depending on actual lifespan, this would be between $60.96 and $91.44.

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