

# LED Light-Bulbs Recommendations

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28 December, 2011

I have been experimenting with LED bulbs available at Lowes and Home Depot. The best, in my opinion, are these Philips bulbs ([http://www.usa.philips.com/c-m-li/led-light-bulbs/standard/latest#filters=LED\\_BULB\\_SU&sliders=&price=&priceBoxes=&page=&layout=12.rating.p-list-view](http://www.usa.philips.com/c-m-li/led-light-bulbs/standard/latest#filters=LED_BULB_SU&sliders=&price=&priceBoxes=&page=&layout=12.rating.p-list-view)):

- Philips 40W Equivalent Soft White (2700K) A19 Dimmable LED 8W 475-lumens Light



Bulb \$11.97 at Home Depot. (Less in packs of 4 online)

- Philips 60W Equivalent Soft White (2700K) A21 Dimmable LED 11W 830-lumens Light



Bulb \$15.97 at Home Depot. (Less in packs of 4 online)

- Philips 75W Equivalent Soft White (2700K) A21 Dimmable LED 15W 1220-lumens Light



Bulb \$19.97 at Home Depot (less in packs of 2 online)

- Philips 100W Equivalent Soft White (2700K) A21 Dimmable LED 19W 1680-lumens Light



Bulb \$24.97 at Home Depot (Less in packs of 2 online)

These are very rugged bulbs. Note the cooling fins on the 15W and 19W bulbs, as LEDs last longer when not subjected to high temperatures

The lifetime for these bulbs is about 23 years @ 3 hours/day.

Each bulb uses about 5 times less electrical energy than its incandescent equivalent does!

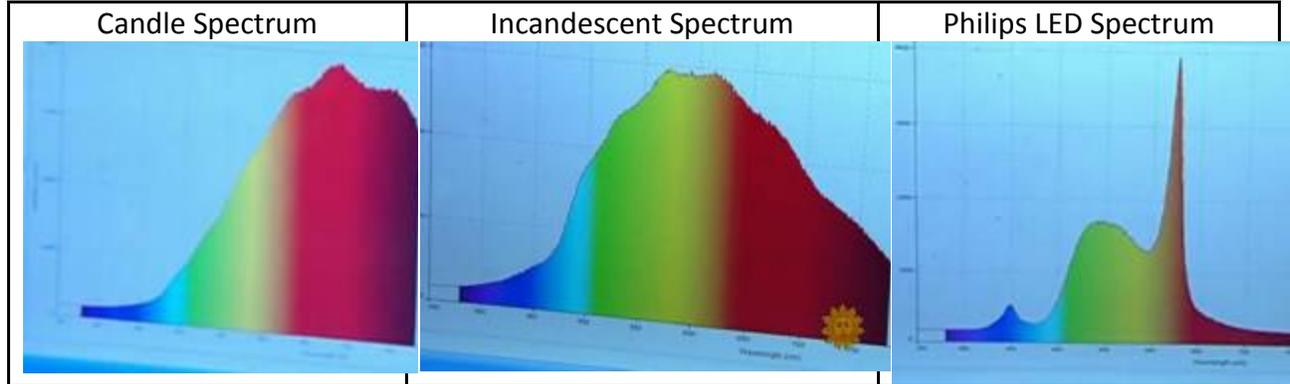
Note the "Soft" or "Warm" color (2700K temperature), which is very close to the color of incandescent bulbs. You can also get "White" light, if you prefer.

These lights won the U.S. Department of Energy L prize (<http://www.lightingprize.org/>).

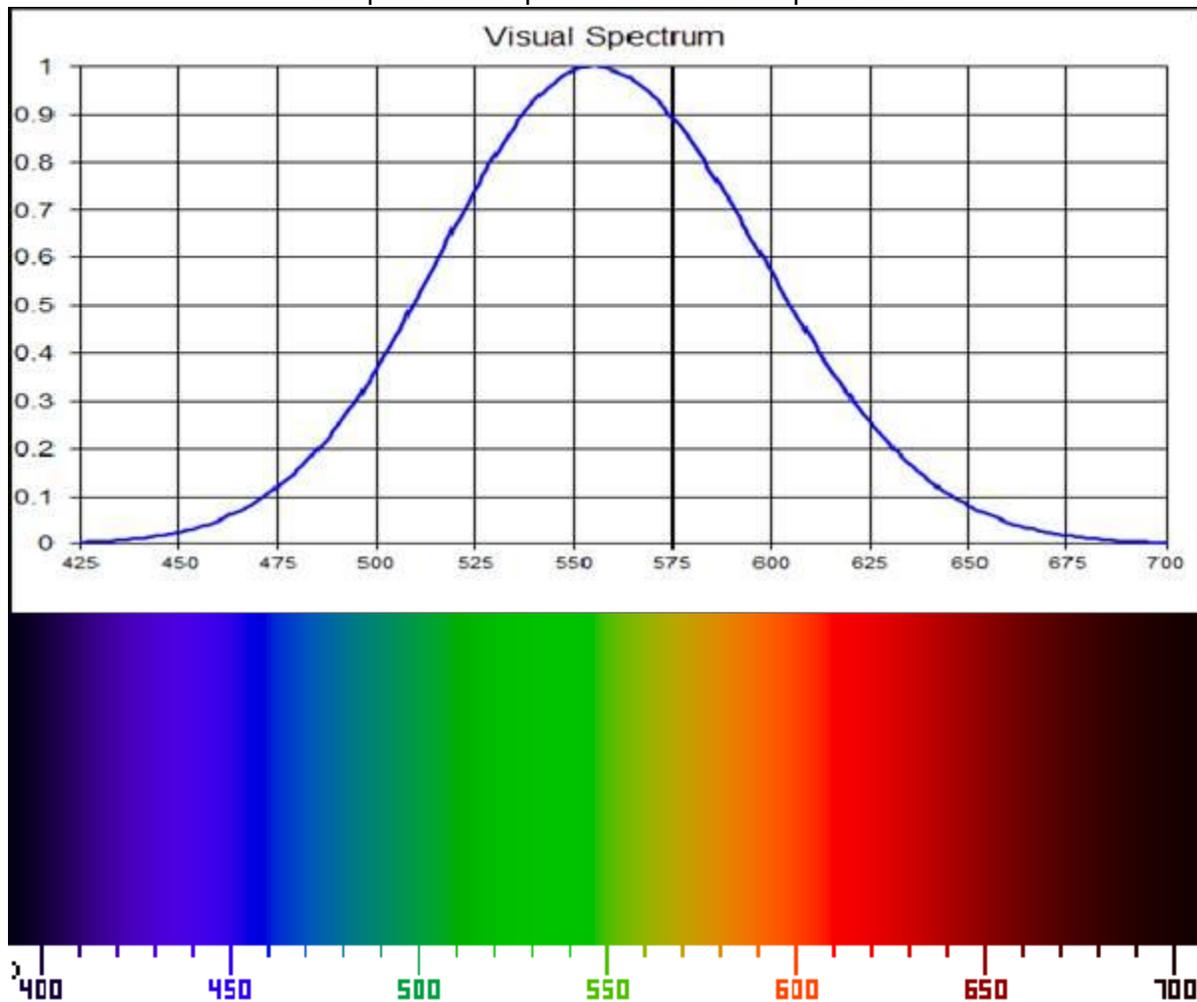
- L-Prize bulb partial teardown:  
<http://www.molalla.net/members/leeper/L%20prize%20bulb.htm>
- <http://www.edn.com/electronics-blogs/readerschoice/4311242/Remote-Phosphors-Philips-LED-bulb-Tear-down-Part-II> .

They were made possible by the invention of a blue-light LED, which won the 2014 Nobel Prize in Physics: <http://www.businessinsider.com/physics-nobel-prize-is-about-more-than-just-a-better-light-bulb-2014-10>

Here is a comparison of the spectra for a candle, an incandescent bulb and the Philips LED bulb:



Compare these spectra to the visual spectrum

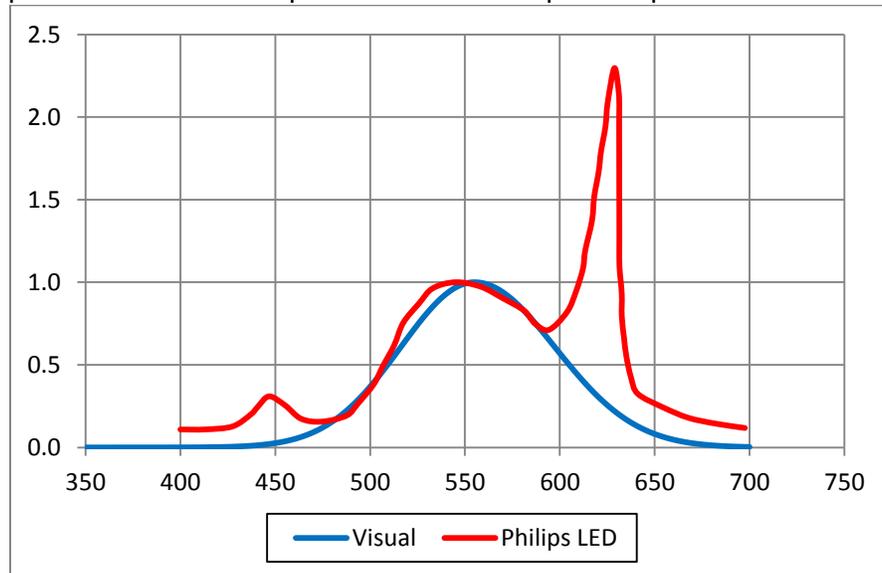


<http://www.roperld.com/science/electromagneticspectraoflightbulbs.pdf>

The visual spectrum peaks in the region between green and blue and falls off rapidly in the red. So the Philips LED spectrum matches the visual spectrum better than the candle and the

incandescent. The candle spectrum peaks too high and both candle and incandescent have too much red.

Here is a comparison of the visual spectrum to the Philips LED spectrum:



The fact that they match well in the peak region is important.

Here is a picture that shows two lamps: one with a 100-watts incandescent bulb and one with the 12-watts Philips bulb. Can you pick out which is which?



Home Depot also sells an EcoSmart LED indoor/outdoor flood light, \$22 (14-watts, 900 lumens, 85W equivalent, 2700K, 25,000 hours, dimmable):



I use four of these outside.

For a very-bright indoor flood light, I use Kobi Electric K5L1 31-watt (150-Watt equivalent) R40 LED 2700K 2550-lumens Warm White Indoor Flood Light Bulb, Dimmable \$44.99 at



amazon.com.

Often recommended are Cree LED bulbs:

<http://www.creeledlighting.com/Products/Lamps.aspx>

<http://www.roperld.com/science/electromagneticspectraoflightbulbs.pdf>

Since a 1500-lumens LED bulb is about 5 times as energy efficient and has about 50 times the life span as an incandescent bulb, it could cost 250 times more than an incandescent bulb to make it have the same energy and longevity value.

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