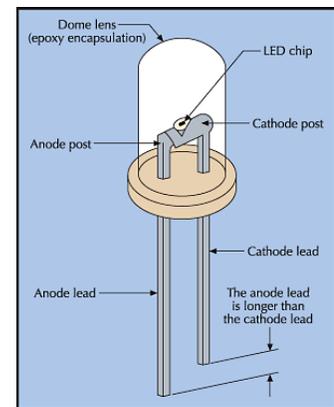


## LED Light Technology

By: Aaron Nichols

If anyone were to go to the store to purchase a flashlight for camping, the clerk will most likely tell you that you absolutely must buy an LED flashlight. The clerk continues to tell you how much better the LED's are than the traditional types of flashlights. He continues to say how much more energy efficient they are, how durable they are, and how they are perfect for camping. And you begin to think, "Man these must be the best lights ever invented. Why aren't all lights LED lights?" This is a very legitimate question with a complex answer. The first thing to do is to explore what an LED light is, and how it works. Then can we look at its application in today's world.

LED stands for light-emitting diode. It emits light by passing a current through a solid chip between the cathode and anode. The chip emits a single or monochromatic light based on two factors, the amount of voltage and the content of the chip. This light that resonates from the chip is extremely concentrated in the visual light spectrum without much infrared spectrum. This is also referred to as "cold-light generation", since a lot of the spectrum from incandescent lights is infrared and emits more heat than light. This means that LEDs are more efficient at emitting light than incandescent light bulbs.



From: [http://ecmweb.com/mag/electric\\_understanding\\_led\\_technology/](http://ecmweb.com/mag/electric_understanding_led_technology/)

Another advantage of LEDs is their compact size. Additionally, they are less toxic because they do not contain mercury, as fluorescent lights do. They have a longer life span than conventional bulbs - some estimate that they can last between 35,000-50,000 hours - and they dim over time instead of burning out like an incandescent bulb.

With all of these improvements and advantages, why aren't LEDs used everywhere? Like most things, LEDs have their disadvantages. The price barrier is one of the first obstacles. Because the technology is relatively recent (started in the last 40 years) and as a result of multiple engineering obstacles, LEDs are difficult to increase in scale and are sensitive to voltage and powering issues. Complex circuitry and resistors are needed to maintain the proper voltage. Also the light that is emitted has its own concerns. The cool-white or blue LED's present a potential "blue-light hazard" hazard, which means that large amounts of exposure to these types of lights can produce eye related problems similar to extreme exposure UV light outside. These types of LEDs also cause a large amount of light pollution in interiors, which is why they are used in small applications or larger outdoor applications.

With all of these ideas in mind, LEDs do show a promising future in the world of lighting. With improvements in technology, it may be possible to incorporate these lights into almost all lighting applications. They definitely have a number of important advantages. So the next time you go the store to purchase that flashlight, think about the best way to find your way through the woods at night. Think about LEDs.

References:

[http://ecmweb.com/mag/electric\\_understanding\\_led\\_technology/](http://ecmweb.com/mag/electric_understanding_led_technology/)

[http://en.wikipedia.org/wiki/Blue-light\\_hazard](http://en.wikipedia.org/wiki/Blue-light_hazard)

[http://en.wikipedia.org/wiki/Light-emitting\\_diode#Considerations\\_for\\_use](http://en.wikipedia.org/wiki/Light-emitting_diode#Considerations_for_use)

<http://www.marktechopto.com/Engineering-Services/history-of-leds-and-led-technology.cfm>