

Some facts about LED lighting

A Light-Emitting-Diode, or LED, is a type of solid-state lighting that uses a semiconductor to convert electricity into light. Today's LED devices can be six-seven times more energy efficient than conventional incandescent lights and cut energy use by more than 80 percent.

Good-quality LED bulbs can have a useful life of 40,000 hours or more -- meaning they can last more than 40 times longer than traditional light bulbs. That is a life of more than five years if run 24 hours a day, seven days a week.

Unlike incandescent bulbs -- which release 90 percent of their energy as heat -- LEDs use energy far more efficiently with little wasted heat.

From traffic lights and vehicle brake lights to TVs and display cases, LEDs are used in a wide range of applications because of their unique characteristics, which include compact size, ease of maintenance, resistance to breakage, and the ability to focus the light in a single direction instead of having it go every which way.

LEDs contain no mercury, and a recent Energy Department study determined that LEDs have a much smaller environmental impact than incandescent bulbs. They also have an edge over compact fluorescent lights (CFLs) that's expected to grow over the next few years as LED technology continues its steady improvement.

The first visible-spectrum LED was invented by Nick Holonyak, Jr., while working for GE in 1962. Since then, the technology has rapidly advanced and costs have dropped tremendously, making LEDs a viable lighting solution. Between 2011 and 2012, global sales of LED replacement bulbs increased by 22 percent while the cost of a 60-watt equivalent LED bulb fell by nearly 40 percent. By 2030, it's estimated that LEDs will account for 75 percent of all lighting sales.

In 2012, about 49 million LEDs were installed in the U.S. -- saving about \$675 million in annual energy costs. Switching entirely to LED lights over the next two decades could save the U.S. \$250 billion in energy costs, reduce electricity consumption for lighting by nearly 50 percent and avoid 1,800 million metric tons of carbon emissions.

LED's and Arts

Besides the above great advantages, LED devices are also scalable to great extends. From the very small (size of a pepper fleck) to a silver dollar, this offers an amazing flexibility of applications. In my work, I try sometimes to make the light source disappear so having a very small device is key. Some are so small that a magnifying glass is needed to differentiate them from dust.

Why don't I use commercially available LED bulbs?

Well, two things. First, there are no commercially available pre-assembled devices that will fit my sculptures , Second, what the industry that manufactures LED bulbs tell you is their products will last 40,000 hours but in effect they don't. Most of the bulbs last sometime less than an incandescent one ! So where are the 5 years of night and day longevity? It is simple and sad. If the LED bulbs where designed to last the lifespan of the LED components within, that would not help businesses make money, imagine replacing a bulb every 14 years or so... So what the industry has done is designed the bulbs to fail after a certain amount of time. It is called the Mean Time Between Failure (MTBF). Just about every appliance we use today is part of that. Ever wondered why we have to replace a fridge every 5 years when the ones built in the 50's are still working today.... MTBF is the answer.

What is my solution?

I use LED's to their near basic form (component level). It is essential in my work because not only provides flexibility of shape, brightness and color but I can also get the critically true LED component usable life. How I do that is by simply having the power supply that feed the LED's to be external, it goes bad, you unplug it and connect the new one in.. done. In a commercial LED bulb, what fails (remember the MTBF) is the internal miniaturized power supply and since there is no way to remove the bad one and replace it with a new one, we are throwing away LED components that are still good.