

Top 10 Benefits of LED Lighting

1. Long Life

Long life time stands out as the number one benefit of LED lights. LED bulbs and diodes have an outstanding operational life time expectation of up to 100.000 hours. This is 11 years of continuous operation, or 22 years of 50% operation. If you leave on the LED fixture for 8h per day it would take around 20 years before you'd have to replace the LED bulb.

LED's are different to standard lighting: They don't really burn out and stop working like a standard light, moreover the lighting diodes emit lower output levels over a very long period of time and become less bright.

2. Energy Efficiency

Today's most efficient way of illumination and lighting, with an estimated energy efficiency of 80%-90% when compared to traditional lighting and conventional light bulbs. This means that about 80% of the electrical energy is converted to light, while a ca. 20% is lost and converted into other forms of energy such as heat.

With traditional incandescent light bulbs who operate at 20% energy efficiency only, a 80% of the electricity is lost as heat. Imagine the following scenario:

If you use traditional lighting and have an electricity bill of e.g US\$ 100, then US\$ 80 of that money has been used to heat the room, not to light it! Using LED illumination with 80% efficiency, the electricity costs would be around US\$ 20 and you'd have saved around US\$ 80.

The long operational life time acts as a multiplier and helps achieve even more energy efficiency, especially large scale and when thinking in terms of urban infrastructure projects, such as cities, railroads and airports.

Think of an airport using energy efficient LED lighting exclusively and achieving a 30% power consumption reduction in comparison with an airport using conventional lighting technology.

Because the long life span of LED lights, also the maintenance work - think of all the work and energy it would take to purchase, stock and change the conventional light bulbs of an airport - you'll see that you can make significant energy savings also when it comes to maintenance and replacement due to the long operational life times of LED lighting.

3. Ecologically Friendly

LED lights are free of toxic chemicals. Most conventional fluorescent lighting bulbs contain a multitude of materials like e.g mercury that are dangerous for the environment. LED lights contain no toxic materials and are 100% recyclable, and will help you to reduce your carbon footprint by up to a third. The long operational life time span mentioned above means also that one LED light bulb can save material and production of 25 incandescent light bulbs. A big step towards a greener future!

4. Durable Quality

LEDs are extremely durable and built with sturdy components that are highly rugged and can withstand even the roughest conditions. Because LED lights are resistant to shock, vibrations and external impacts, they make great outdoor lighting systems for rough conditions and exposure to weather, wind, rain or even external vandalism, traffic related public exposure and construction or manufacturing sites.

5. Zero UV Emissions

LED illumination produces little infrared light and close to no UV emissions. Because of this, LED lighting is highly suitable not only for goods and materials that are sensitive to heat due to the benefit of little radiated heat emission, but also for illumination of UV sensitive objects or materials such as in museums, art galleries, archeological sites etc.

6. Design Flexibility

LEDs can be combined in any shape to produce highly efficient illumination. Individual LEDs can be dimmed, resulting in a dynamic control of light, color and distribution. Well-designed LED illumination systems can achieve fantastic lighting effects, not only for the eye but also for the mood and the mind: LED mood illumination is already being used in airplanes, classrooms and many more locations

and we can expect to see a lot more LED mood illumination in our daily lives within the next few years.

7. Operational in Extremely Cold or Hot Temperatures

LED are ideal for operation under cold and low outdoor temperature settings. For fluorescent lamps, low temperatures may affect operation and present a challenge, but LED illumination operates well also in cold settings, such as for outdoor winter settings, freezer rooms etc.

8. Light Dispersement

LED is designed to focus its light and can be directed to a specific location without the use of an external reflector, achieving a higher application efficiency than conventional lighting. Well-designed LED illumination systems are able to deliver light more efficiently to the desired location.

9. Instant Lighting & Frequent Switching

LED lights brighten up immediately and when powered on, which has great advantages for infrastructure projects such as e.g traffic and signal lights. Also, LED lights can be switched off and on frequently and without affecting the LED's lifetime or light emission. In contrast, traditional lighting may take several seconds to reach full brightness, and frequent on/off switching does drastically reduce operational life expectancy.

10. Low-Voltage

A low-voltage power supply is sufficient for LED illumination. This makes it easy to use LED lighting also in outdoor settings, by connecting an external solar-energy source and is a big advantage when it comes to using LED technology in remote or rural areas.

http://www.luminanz.co.uk/tech_disadvantages.php
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Disadvantages of using LEDs

High price:

LEDs are currently more expensive, price per lumen, on an initial capital cost basis, than most conventional lighting technologies. However, when considering the total cost of ownership (including energy and maintenance costs), LEDs far surpass incandescent or halogen sources and begin to threaten compact fluorescent lamps.

Temperature dependence:

LED performance largely depends on the ambient temperature of the operating environment. Over-driving the LED in high ambient temperatures may result in overheating of the LED package, eventually leading to device failure. Adequate heat-sinking is required to maintain long life. This is especially important when considering automotive, medical and military applications, where the device must operate over a large range of temperatures, and is required to have a low failure rate.

Light quality:

Most cool-white LEDs have spectra that differ significantly from a black body radiator like the sun or an incandescent light. The spike at 460 nm and dip at 500 nm can cause the colour of objects to be perceived differently under cool-white LED illumination than sunlight or incandescent sources, due to metamerism; red surfaces being rendered particularly badly by typical phosphor based cool-white LEDs. However, the colour-rendering properties of common fluorescent lamps are often inferior to what is now available in state-of-art white LEDs.

Blue pollution:

Because cool-white LEDs (i.e. LEDs with high colour temperature) emit much more blue light than conventional outdoor light sources such as high-pressure sodium lamps, the strong wavelength dependence of Rayleigh scattering means that cool-white LEDs can cause more light pollution than other light sources. It is therefore very important that cool-white LEDs are fully shielded when used outdoors. Compared to low-pressure sodium lamps, which emit at 589.3 nm, the 460 nm emission spike of cool-white and blue LEDs is scattered about 2.7 times more by the Earth's atmosphere. Cool-white LEDs should not be used for outdoor lighting near astronomical observatories.

15 Benefits of LED Lighting

DID you know that a normal incandescent light bulb is actually a heater with the byproduct of light? Over 90% of its energy is turned into heat making it an outrageously inefficient, not to mention hot, light source. Fluorescents contain mercury. Fluorescents are prone to breaking, and when a bulb breaks, that neurotoxic element can taint your home or office.

For years, LEDs were high cost alternatives to the fluorescent bulb, a compact fluorescent, with several other problems such as bad colors, harsh light and poor dimming abilities. But in the last year the price of LED lights has dropped significantly, the colors have been modified, and they are more flexible than ever. Let's look at the 15 benefits of LED lighting.

1. Long Lifetime

Long lifetime stands out as the number one benefit of LED lights. LED bulbs and diodes have an outstanding operational lifetime expectation of up to 11 years of continuous operation, or 22 years at 50% operation. If you leave a LED fixture on for 8 hours per day it would take around 20 years before you'd have to replace the LED bulb. Lighting diodes emit lower output levels over a very long period of time and become less bright, while LEDs maintain their original brightness throughout their lifespan.

2. Efficiency

LEDs consume far less power than fluorescent tubes. Simply put, LEDs use less electricity, with an estimated energy efficiency of 80%-90% when compared to traditional lighting and conventional light bulbs. This means that about 80% of the electrical energy is converted to light, while 20% is lost and converted into heat. Because of the long lifespan of LED lights, the maintenance work is significantly less, meaning you'll see big energy savings.

3. Eco-friendly

LED lights contain no toxic materials and are 100% recyclable; they'll help you reduce your carbon footprint. One LED light bulb can save material and production of 25 incandescent light bulbs.

4. Durability

Because LEDs are not made of glass and are hollow inside, they are far less fragile than both fluorescent and incandescent bulbs. This makes them much more durable, less likely to be inoperable due to being dropped, and can withstand harsh conditions. Because LED lights are resistant to shock, vibrations and external impacts, they make great outdoor lighting systems for exposure to weather, wind, rain or even external vandalism, traffic related public exposure and construction or manufacturing sites. For freezer rooms and iceboxes, they are the perfect bulbs.

5. No Heat

That's right; no heat. Unlike incandescent and fluorescent bulbs, LEDs are easy to the touch even after they are on for hours so they carry less risk of causing an accidental fire or burn. Also consider the cost it takes to cool the air that other bulbs heat up. A single 100w light bulb costs about \$1.13/month just to cool the heat it produces.

6. No Emissions

LED illumination produces little infrared light and close to no UV emissions. Because of this, LED lighting is highly suitable not only for goods and materials that are sensitive to heat, but also for illumination of UV sensitive objects or materials from artwork in museums to plastics in a kitchen.

7. "Dimmability"

LEDs can be dimmed, resulting in a dynamic control of light, color, flexibility and distribution. Well-designed LED illumination systems can achieve fantastic lighting effects, not only for the eye but also for the mood. LED mood illumination is already being used in airplanes, classrooms and many more locations and we can expect to see a lot more LED mood illumination in our daily lives within the next few years, in homes, offices, hotels, restaurants, etc. Stores with LED lighting sell 30% more merchandise!

8. Light Disbursement

LED is designed to focus its light and can be directed to a specific location without the use of an

external reflector, achieving higher application efficiency than conventional lighting. Well-designed LED illumination systems are able to deliver light more efficiently to the desired location.

9. Instant Lighting

LEDs provide instant light and illumination; they brighten up when powered on, which has great advantages for infrastructure projects such as traffic and signal lights. LEDs work when an electrical current is passed through them - no flickering. In contrast, fluorescent lights don't provide optimum illumination levels until they have been running for a few minutes and flicker when switched on.

10. Frequent Switching

LED lights can switch off and on frequently and without affecting the LED's lifetime or light emission, unlike traditional lighting that may take several seconds to reach full brightness. Also, frequent on/off switching of traditional bulbs drastically reduces operational life expectancy.

11. Low-Voltage

A low-voltage power supply is sufficient for LED illumination, making it easy to use LED lighting in outdoor settings by connecting an external solar-energy source which is a big advantage when it comes to using LED technology in remote or rural areas.

12. Long-Term Cost

LEDs are still more expensive than fluorescent and compact fluorescent lights, but they are far less expensive than they were a year ago (<http://www.greentechmedia.com/articles/read/leds-to-drop-10x-in-price-in-3-years-but-will-the-u.s.-lead-the-industry>) and can provide huge long-term savings. While incandescent lights last for 800 to 1500 hours, and fluorescent lights last up to 10,000 hours, LEDs can last up to a whopping 60,000 hours. This can provide substantial savings as a result of fewer replacements needing to be bought.

13. Short-Term Cost

As stated above, prices of LED have significantly dropped in the last year. Home Depot's 800 lumen Philips LED bulb is priced just under \$40.00 and consumes 12 watts. A 40-watt equivalent from Lighting Sciences Group, which consumes less than 8 watts, costs just under \$18.00. If you used a bulb for just 2 hours a day and paid the national average of \$0.115 per kilowatt-hour, a single 12-watt LED will cost you about \$1.00/year. Comparable CFLs that consume about 14 watts come to \$1.17/year and about \$5.00/year for 60-watt incandescent in that scenario.

14. Noise

Fluorescent tubes are notorious for being noisy, especially if they have been used for an extended amount of time. They tend to give off clicking sounds intermittently, but most annoyingly, they can produce a low buzzing sound. Since fluorescent tubes are often used in offices and working environments, this can be distracting. LEDs do not have this problem and operate silently with no annoying flickering noises.

15. Color

Fluorescent lights are infamous for their color profile. While some fluorescent tubes now use a different type of phosphorous powder to produce a warmer color, most fluorescents produce only a cold blue/white light. It is stark and not very welcoming. LEDs on the other hand provide a range of different colors for different purposes and needs. This is what makes LEDs so adaptable. They can be used in almost any environment or lighting situation.