

LED Demand Continues to Grow

Pressure continues to mount for OEMs to produce products with greater functionality, speed and performance characteristics as the demand for lighter, portable and hand-held electronics increases. LEDs are an integral piece in many electronic products and manufacturers face ongoing challenges, especially with fitting the circuit board with the most suitable LED components.

LEDs are used by many industries (industrial manufacturing, telecommunication, healthcare, automotive, aerospace) and have numerous appealing qualities—low operating voltage and power; compact sizes; extended lifetime and stability; and they're dependable enough to use in many PCB applications. Most importantly, they produce light while generating less heat than incandescent bulbs making them safer for continuous use.

Through-hole, Surface Mount or Chip-On-Board?

Three basic component categories exist in the LED world—Through-hole (PTH), Surface Mount (SMT) and Chip-On-Board (COB). The capabilities and history of each can help with understanding the progression of the LED light.

Through-hole LEDs have been around since the 1960s and come in several body types and sizes (3mm to 10mm.) With the advent of cell phones and computers, the need for miniaturization grew and consequently surface mount devices (SMDs) started replacing through-hole devices.

SMDs allow for higher density and PCB size reductions. Additionally, SMDs leverage automated assembly systems and therefore greatly diminish the need for hand soldering. With SMD components can be mounted on both sides of PCBs. This type of LED is what's commonly used today.

In the late 2000s, the demand for high density and greater efficiency rose further and with that came the introduction and use of Chip-On-Board (COB) devices. The chip or die can be mounted directly on the PCB using conductive paste or by soldering followed by wire bonding. COB technology almost eliminated any need for additional device packaging like lead frames and housings and also added better thermal dissipative qualities, reduced size and increased LED density.

The evolution of LEDs will continue and the expectation is that costs will go down as companies continue to find innovative ways to improve their performance and eliminate any drawbacks. Furthermore, it's predicted that by 2020, LED lamps will become the dominant lighting technology and prices will have fallen by 80%. LED usage is growing in the general lighting, automotive and display markets, along with niche markets such as horticulture and wearable electronics.

General LED benefits -

LEDs last longer and do not need to be replaced as often as many conventional light sources.

Because LEDs have no movable parts or filaments that may break, they last longer. This makes them especially useful when installations and replacements of luminaires may be challenging, i.e., excessive heights and other difficult to service locations (windmills, telecommunication towers, chimney stacks).

LEDs are more efficient than many conventional light sources.

All of the light emitted by an LED points in one direction allowing for less reflections inside the luminaire so they're very suitable in situations where only downward lighting is needed. However, if light distribution is needed for both up and down, the LED is less suitable, e.g., if compared to a T5 fluorescent lamp.

LEDs offer new possibilities for color tuning.

Because LEDs are electronic components, they can be easily controlled (tuned) using software and control gear. A LED luminaire color can be mixed and could include red, blue and green diodes resulting in either colored light or white light. The different color temperatures make it possible to produce cool and warm colored light. This capability comes in handy in office environments, schools and hospitals where concentrated light might be warranted, e.g., during a patient examination. LEDs can also, however be tuned to a warm temperature where more relaxing lighting may be desired, e.g., yoga cool down. This attribute is also being maximized to increase the growth of plants and reduce water consumption.

LED investment and Total Cost of Ownership (TCO)

Many applications lend themselves to using LEDs, but not all. Analyzing the total cost of ownership when investing in LEDs including the energy costs, lamp change costs and cleaning costs can be crucial. Take time to fully consider all costs and suitable applications before making a final decision to transition or make new investments in LEDs.

[Infographic showing the history of the LED light](#)

If you have any questions about LEDs, please contact your Hisco representative or call our customer service department at 877-447-2650.