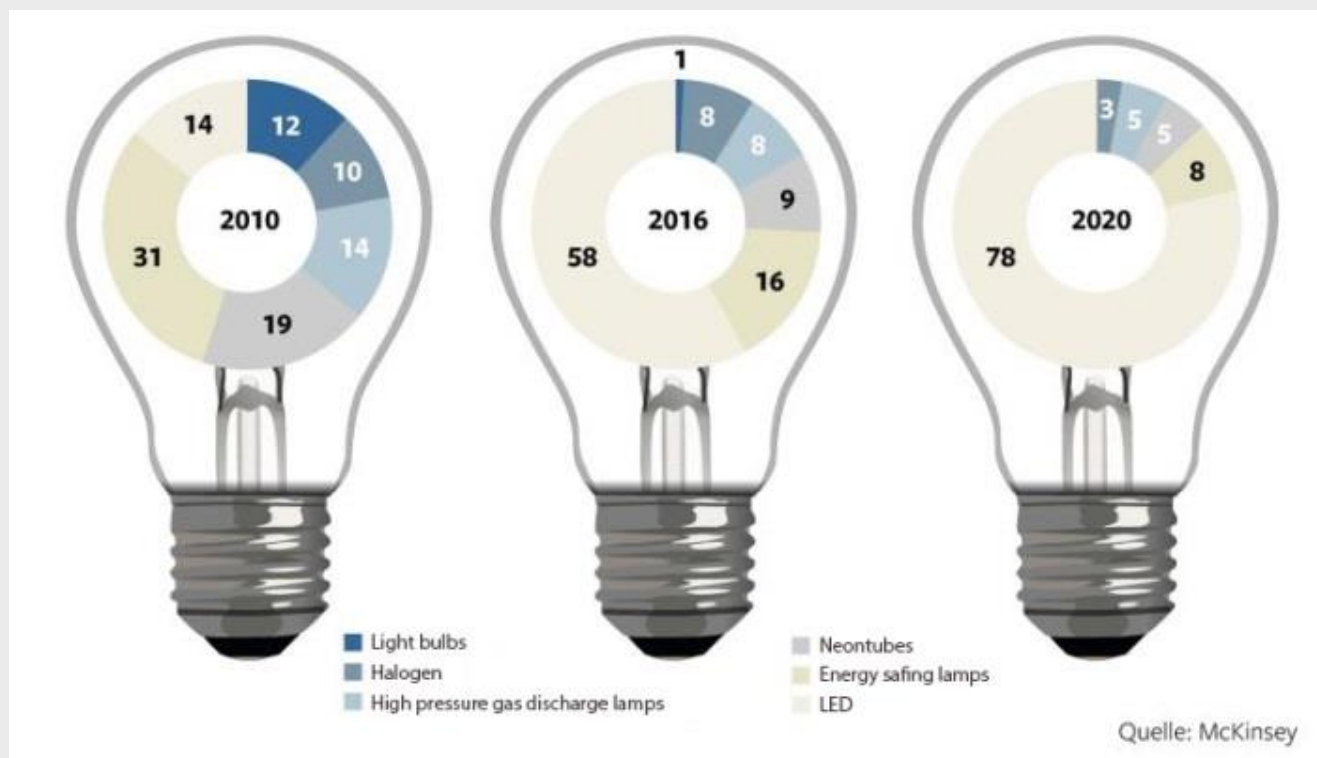


LED Lighting technology and the challenges of connection

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Percentage share of lighting market per technology in %

The importance of LED technology in the lighting industry has increased rapidly in the last few years. Bright, power-saving light emitting diodes now produce not only pleasant light but also offer ecological and financial advantages compared with conventional light bulbs.

Artificial light is an indispensable aspect of modern life. It is used to make dark streets safer and enables us to live and work in the absence of natural light.

In recent years, LED technology has undergone rapid developments and now outpaces

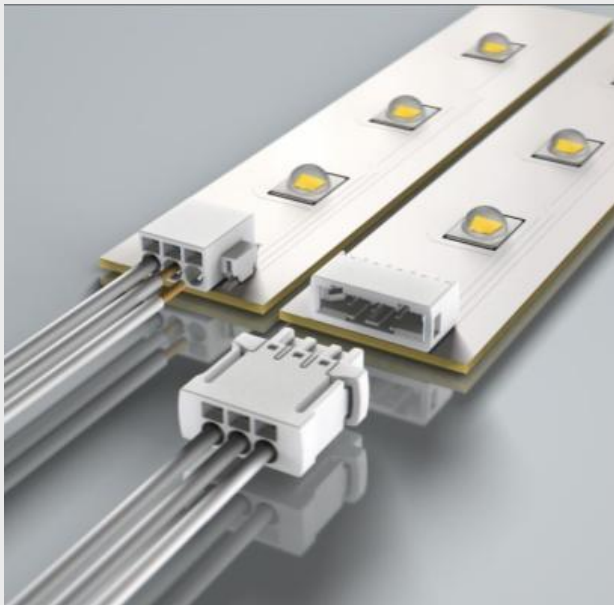
conventional light bulbs. While in 2010 LEDs represented just 14 % of all lights sold, the market share today is 58 % - and still climbing.

The advantages are obvious. Lower power consumption and longer lifetimes represent significant cost savings. Especially in industry, where lighting is operated throughout the year, 24/7. Modern high performance diodes can take up much higher loads compared with earlier, but despite significantly higher levels of efficiency still generate heat which has to be dissipated by the PCB.

If this heat is not dealt with, the semiconductor elements in the LED may overheat.

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White PCB connectors can effectively reduce shadows

This is initially noticeable by way of a change in the colour of light, and in falling light output. Ultimately it can result in failure of the LED. It is for this reason that high performance LEDs are mounted on PCBs with a metal core in order to dissipate the heat and provide cooling. This mounting connection was previously hand soldered, making it unreliable and a source of errors.

The removal of heat made possible by the metal core is positive for the LED but the hand-soldered connections often meant the necessary temperatures for a reliable connection were not achieved, creating contact problems.



Example of a typical hand-soldered connection

In order to achieve a stable and robust process, the industry now uses PCB connections which are processed in the same reflow soldering process together with the LEDs. SMD-capable har-flexicon connectors are both temperature and colour-stable and thanks to the use of automated mounting and soldering processes simplify production overall to give users the desired high level of reliability.

Whereas most exterior lamps are of a black material in order to avoid reflections of sunlight, most indoor LED lamps use white surfaces in order to enhance reflections. The use of white and in particular flat components is also able to reduce levels of interference caused by shading. This also applies to the insulating body of the PCB connector. HARTING now supplies har-flexicon PCB connectors in not only standard black but also in a white version specifically designed for lighting systems.

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Robust and flexibly detachable connections allow broadest possible range of applications

This version is available with 2- and 3-pole connecting terminals for flexible and rigid conductors with cross-sections of up to 0.75 mm². They are the type most frequently preferred in lighting technologies. By offering users a nominal current carrying capacity of 6A, they provide sufficient reserves when dimensioning lighting bodies.

The push-in spring-loaded connecting technology allows repeat connectability, reduces the sources of errors and increases the service-friendliness of lamps. The optimised connections for LED applications represent an important building block for professional LED lighting.



har-flexicon family, in black and white, in a direct comparison

The HARTING har-flexicon system represents a reliable and industrially-viable PCB connection technology which also reduces interfering shade on LED modules.