

## Media backgrounder

### Philips and Solid State Lighting (LED)

#### Solid state lighting: more than just a new lighting technology

Today, most lighting specialists agree that the arrival of a new solid state lighting light source, the LED, is going to have a revolutionary effect on the lighting industry and on lighting in particular. We have not seen anything like this since the discovery of electric light 126 years ago. Although it's been a niche-market for general lighting markets in the past, the creation of high power white-light LEDs a few years ago has transformed its potential. Solid state lighting will revolutionize how we light our homes, our cars, our shops and our cities.

#### Philips and LEDs

Throughout its history, Philips has been improving people's lives through lighting. As the number one player in lighting, Philips is leading the solid state lighting revolution with a broad expertise in all segments of the value chain.

#### *Expertise in all phases of the LED value chain*

The LED business value chain is different from the conventional lighting business chain. There are four different stages. First is the die (chips), which, in the next stage, is given electrical connections and a primary optic. A power supply and secondary optics in a module are added in the third stage and the final stage is inclusion in end products such as mobile phones or lighting fixtures.

In the past few years, Philips has acquired three companies to strengthen its position in solid state Lighting (LEDs). The acquisitions put Philips Lighting at the forefront of this new technology, setting the pace in the industry. It acquired Lumileds, then TIR Systems and Color Kinetics, and now holds a solid position in all aspects of the value chain, including technology, applications and IP. And with the acquisition of Genlyte (professional luminaires\*) and PLI (consumer luminaires) Philips has a springboard to market LED based luminaire solutions.



Die



LED



Module



Luminaire

## **Ilte Luce**

Philips latest acquisition is Italian based company Ilte Luce. Ilte Luce is one of the leading LED design professional luminaires companies in Europe for architectural indoor lighting. This acquisition fits very well in Philips Lighting's strategy and growth ambitions. The combination of the world leader in solid-state lighting with the entrepreneurial spirit of a high-end indoor solutions provider for architectural lighting enhances our presence in solid-state lighting as well as in strengthening its position to high-end end-user systems.

## **What is an LED?**

An LED (Light Emitting Diode) is a tiny light bulb that fit easily into an electric circuit. It's a different light generating technology from that used in traditional incandescent bulbs or fluorescent lamps. But unlike ordinary incandescent bulbs, they don't have a filament that will burn out, and they don't get especially hot. They are illuminated solely by the movement of electrons in a semiconductor material, and they last just as long as a standard transistor.



LED technology dates back from the late 1960s and was initially used for indicator purposes in, for example, consumer electronics equipment. In the last 10 years considerable progress has been made in LED technology, making it possible for it to be used as a light source for illumination purposes. Until the early 1990s, however, LEDs were only possible in red and green. When the first blue LED was developed, it became possible to create white light (on the basis of red, green and blue mixing, or on the basis of blue with phosphor conversion).

LEDs are still continuing to develop. At the moment, the level of efficiency is more or less doubling every two years.

## **Benefits of LEDs**

LEDs are extremely practical, because they are small, robust and are based on low-voltage technology. They can offer endless colours in a dynamic way and are fully dimmable. LEDs offer us the chance to create lighting solutions in places and in ways that were never possible before. It's a world of endless creative possibilities. And given their long lifetime, low maintenance cost and potential to significantly reduce energy consumption (up to 80% today) and, indirectly, CO2 emissions they also represent an excellent environmental choice.

LEDs open the way to new applications, also in emerging markets. For instance, we may see new forms of lighting in rural areas of countries like India, China or Sub-Saharan African countries where power supplies are limited.

## **Philips LED based solutions**

Today, Philips offers a complete range of LED Lighting Systems – and not just bare LEDs, but specially designed LED-based solutions. What follows are brief descriptions of all the areas we're expert in.

### *City Beautification*



For some time now LED lighting systems have been used to light up buildings, bridges and monuments in our cities. Due to their flexibility, low maintenance costs and the possibility to set any desired color, LEDs offer lighting solutions that are simply not possible with any other existing technologies; for example, creating effects such as color wall washing, and sharp light/shadow lines. LEDs are also ideal for minimizing light 'pollution' since their light can be precisely targeted.

### **Office lighting**



Offices are already seeing the first niche LED applications with desk lights and particularly emergency lighting and Philips is now introducing LED based solutions for general illumination. We integrate LEDs into ceilings, wall panels and floor tiles in, for example, reception areas, restaurants and guest areas where more decorative effects are required. These will be typically high end and prestige type projects.

### **Industrial lighting**

LED replacements / retrofits are already making a small impact in industrial areas. LEDs are ideal because they operate at Safety Extra Low Voltages of typically 12 or 24V. Their reliability and long life is also a clear advantage in lower maintenance, as downtime can be highly expensive and possibly dangerous. LEDs' instant flicker-free turn on is important for emergency and security lighting.

### **Road lighting**



LED clusters have been used as incandescent lamp replacements in traffic signals and pedestrian lights for some years, particularly in the USA (around 30% in 2002) and in Europe. Since red LEDs need no filters, they save a lot of energy (color filtered incandescent lamps can lose 90% of available light).

LEDs' high reliability is crucial: replacing lamps is expensive and failed signals are dangerous. LED lighting is already becoming available in markets for pedestrian and residential areas next to roads and LEDs clearly have the potential to change the way we light our streets and roads at night, for example by being embedded into new pavements or safety fences etc.

### **Hotel , restaurant, bar and cafe lighting**



Hotels are installing LED lighting for decorative purposes and in bedside and standing lamps. Hospitality lighting costs are high and a change to LEDs makes economic sense. LED energy savings are important for another reason - it is increasingly important for hotel operators to emphasize their sustainability credentials. Philips is introducing various LED based solutions, like the MasterLED, which is an alternative for halogen, incandescent and CFLi.

LED lighting is growing fast in this sector where decorative effects are key. For example, LEDs offer major benefits over traditional neon lamps because they are smaller and more robust, last longer, need less maintenance, save energy and operate on a low voltage). Furthermore the dynamic use of color and new effects offers owners opportunities to differentiate themselves and create welcoming environments for customers.

### **Retail lighting – supermarkets**

Commercial freezers are already being fitted with LEDs as replacements for TL fluorescent lamps. The reason is that conventional TL lamps do not last long at -20° C. Unaffected by cold, LEDs are more energy efficient and will outlast the freezer cabinet. They are also less easily damaged. In addition, Philips introduced LED downlight solutions, saving up to 50% compared to CFLis, and a 40W equivalent retrofit solution.

### **Retail lighting - fashion and high end**



LEDs are already being used in shops for the creation of a specific ambience and dynamic effects, for example, in shelf lighting (where traditional fluorescent lamps are too large to be used) and for color wall washing between merchandize. LEDs are also being used to replace fluorescent, incandescent and neon lamps. In addition, their low energy consumption, bright clear colors and long life make them ideal for signage.

## **Home Lighting**

LED lighting is already being used today in homes as decorative lighting, very often using colors. A key feature of LED lighting is the ability to change the color of the light. This opens up the possibility of personalizing the light effect to change the ambiance in a room, or to change the color of different objects. Thanks to their small and flexible shape, LEDs are also being built into design furniture, high-end kitchens, bathrooms and so on, giving them an additional decorative element. They are also being developed for wider applications, such as garden. New is a range of LED Luminaires, called Ledino, which is a world beating range for general illumination in the home.

\* a luminaire is an integrated lighting fixture.

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### **About Royal Philips**

Royal Philips of the Netherlands (NYSE: PHG, AEX: PHI) is a diversified Health and Well-being company, focused on improving people's lives through timely innovations. As a world leader in healthcare, lifestyle and lighting, Philips integrates technologies and design into people-centric solutions, based on fundamental customer insights and the brand promise of "sense and simplicity". Headquartered in the Netherlands, Philips employs approximately 121,000 employees in more than 60 countries worldwide. With sales of EUR 26 billion in 2008, the company is a market leader in cardiac care, acute care and home healthcare, energy efficient lighting solutions and new lighting applications, as well as lifestyle products for personal well-being and pleasure with strong leadership positions in flat TV, male shaving and grooming, portable entertainment and oral healthcare. News from Philips is located at [www.philips.com/newscenter](http://www.philips.com/newscenter).