

OSRAM Opto Semiconductors – Energy-efficient lighting for the world of tomorrow

OSRAM Opto Semiconductors develops intelligent lighting solutions and is one of the world's leading manufacturers of optoelectronic semiconductors. For more than 30 years the company has stood for innovative semiconductor technologies, setting standards in a wide range of applications. Its product portfolio includes components for the illumination, visualization and sensing sectors. High-power light emitting diodes (LEDs), semiconductor lasers, infrared diodes (IREDs), detectors and organic LEDs (OLEDs) are among the most well-known products. The range of LED light sources covers everything from miniature components for backlighting cell phone displays to extra bright units for street lighting, TV screens and automobile headlights.

The company's headquarters are in Regensburg, Germany. The site includes the world's most advanced production facility for opto-semiconductor chips and the central research and development laboratories. More than 1800 employees produce the highly complex LED chips and design new products and applications. The company's site in Penang (Malaysia) has been manufacturing LEDs for worldwide distribution for more than 20 years. A chip fabrication facility will be going into production there at the start of 2009, almost doubling the company's production capacity. The company's headquarters for North America is in Sunnyvale (USA), and for Asia in Hong Kong. As a former part of the Semiconductor Group of Siemens, the company has many years of experience in the development and manufacture of LED lighting solutions. Today, it is a wholly owned subsidiary of OSRAM, the lighting manufacturer, and therefore part of the Siemens Industry sector.

The success of LED technology is due to the exceptional technical properties of LEDs and the rapid development of consumer electronics. Their small size and impressive energy efficiency have been the main contributory factors. Whereas incandescent lamps achieve an efficiency of 10 lm/W (lumens per watt), and halogen lamps around 20 lm/W, the value for white LEDs is between 40 and 100 lm/W. And power consumption is only 0.1 to 15 W. This means that light emitting diodes emit considerably more light than other light sources from smaller power consumption. In July 2008, OSRAM increased the

records for the brightness and efficiency of white LEDs in the laboratory to around 155 lm and 140 lm/W. Today, LEDs are around five times more efficient than incandescent lamps – and further technical developments will make them more than ten times efficient in the future. Replacing conventional light sources with LEDs would theoretically halve global electricity consumption for lighting. And if they were combined with intelligent lighting management systems the savings would be more than two thirds. Demand for LEDs increased rapidly as they became standard components in displays for cell phones, computers and large-format display panels. The market will continue to exhibit dynamic growth as LEDs become firmly established as universal light sources. Analysts are forecasting double-figure annual growth once the current global recession is over. Thanks to its powers of innovation, its patented technologies and established sales structures the company is well equipped to take advantage of these developments.

The automobile industry embraced this brilliant all-rounder a long time ago. They not only act as light sources – car manufacturers have recognized their value as design elements and differentiation features and are installing them as standard equipment in daytime running lights and taillights. They are also developing new headlight functions. The Audi A4 for example gets its distinctive looks from the unusual front LED strip. The “invisible” areas of vehicle are also represented, with semiconductor lasers and infrared diodes being used for example for adaptive cruise control systems to improve road safety. Designers and architects are making full use of the light sources, creating extravagant lighting systems that catch the eye. Public authorities are looking more and more to long-life eco-friendly LED lighting systems for street lighting and architectural illumination. From Johannesburg to Heidelberg and Singapore there are already street lights in use that are solar powered. The combination of the two energy-saving technologies has led to cost savings of up to 44% compared with conventional lighting systems. The first tunnel entirely equipped with LED lighting has been in operation since the fall of 2008 in Thüringen.

The general illumination sector is one of the areas with the brightest future. Developments here will be assisted by the politically backed trend toward more energy-efficient lighting. Already LEDs are being used in homes and offices and will replace conventional incandescent lamps in the long term. LEDs will one day be taken for granted as standard light sources – and so too will OLEDs. Rapid developments in brightness levels means that we can expect many further innovations in entirely new areas of application.

Investment of up to 15 percent of annual sales in research and development at OSRAM Opto Semiconductors creates a stable framework for consistently high performance. In the past 30 years the company has produced pioneering technologies and now holds more than 4000 patents. Special programs promote a culture of innovation in the company; scientific work and investigations are supported in terms of finance, structure and resources. Overarching project partnerships in national and

international programs are an important motor for new technologies. A large proportion of products result from innovative teamwork and close cooperation with customers and partners. This has been a major factor in our ability to establish numerous standards in lighting technologies, notably the development of the first surface mounted LED (TOPLED), the first LED with a white light color and the exceptionally versatile OSTAR platform. The company has received various awards for many of these developments. OSRAM developers gained their most prestigious award in December 2007 when Dr. Klaus Streubel and Dr. Stefan Illek, together with Dr. Andreas Bräuer from the Fraunhofer Institute for Applied Optics and Precision Engineering received the German Future Prize from Federal President Horst Köhler. The team were awarded this most innovation prize in Germany for its development of thin-film chip technology and for the application of this technology in the manufacture of high-power light emitting diodes.

For more information go to www.osram-os.com

Overview

OSRAM Opto Semiconductors GmbH

Established: 1999

Industry: Manufacturer of optoelectronic semiconductor components (LEDs, IR components, semiconductor lasers). The company supplies products and system solutions for illumination, visualization and sensing.

Turnover: EUR 529 million (30.09.2008)

Employees: 4600 worldwide

Awards: 2007 German Future Prize from the Federal President for technology and innovation
2007 Best Innovator (Wirtschaftswoche, AT Kearney)
2006 Science Award from the Stifterverband
2006 PACE Award (Automotive News, SAP, Microsoft et al)
2005 Innovation Prize INTEL Design (INTEL)