

Strategies in Light[®] Europe

EPIC Members Event Report Strategies in Light Europe

Munich, Germany
21 November 2013

Originally submitted to

electro
optics

www.electrooptics.com/news/news_story.php?news_id=1976



Prepared by:
Calogero Sciascia, Senior Scientist
Saes Group S.p.A.
Viale Italia 77, 20020 Lainate (MI) - Italy
Calogero_Sciascia@saes-group.com
www.saes-group.com

About the EPIC Members Event Reports

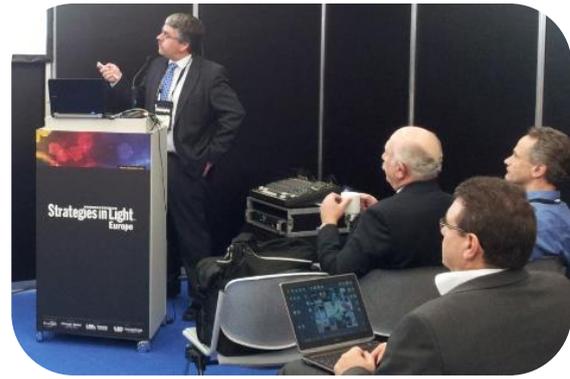
Initiated by the founder of EPIC Dr. Thomas Pearsall in 2003, these reports are prepared by members of EPIC to the benefit of the wider community. If you did not have a chance to attend the event but would like to know some key highlight, this report is for you. Emphasis is placed on exploring technical and business opportunities for the members of EPIC.



EPIC Lighting Technology Session

Nowadays speaking about lighting means speaking about LEDs, and Strategies in Light fair was an excellent opportunity for having a wide overview on the current state and future perspectives of LEDs' industry. As a matter of fact, traditional lighting sources (halogen, fluorescent and discharge lamps) have still a dominant position in the domestic and industrial lighting markets, however all the interest seems now devoted to solid state lighting and for sure the GaN-based technology is the unquestioned protagonist of the story. The LEDs offer such large benefit in terms of light efficiency, robustness, lifetime, design flexibility and configurability etc. that major lighting companies are not allowed to miss this train. Of course, the peculiar properties of these devices, make them attractive also for other kind of companies that used to operate in business where lighting had a small relevance: we are speaking of semiconductor and electronics industry as well as some chemical companies.

This edition of Strategies in Light Europe was based in Munich and took place from 19 to 21 of November. Apart the commercial stands and the economic and technological forum, the fair also hosted a special free session organized from Epic consortium. In this space, several speakers shared their personal contribution from different point of views, covering different aspects of this complex and multi-faceted world which involves semiconductor growth, packaging technology, electronic circuitry and much more. Recent technological achievements as well as technological and market perspectives were debated. What emerged was a quite broad scenario that involves many disciplines, where many aspects have to be taken into account for a successful development of LEDs.



Prof. Michael Heuken, vice president corporate research and development at AIXTRON SE, opened the session with an historical introduction: quite surprisingly the story of gallium nitride devices dates back to 1951 with a patent for substituting Silicon with III-V semiconductor. Since there, a lot of way has been made and prof. Heuken described the basic concept behind a modern LED device and the metal-organic vapour phase epitaxy (MOPVE) as preferred growth technique for achieving such fine control on the structure. As a common trend for semiconductor industry, the growth reactors become larger and larger in order to accommodate larger wafers and/or more substrates, being the first option preferred for GaN on Si and the second for GaN on Sapphire.

Remaining stuck on semiconductor growth, Dr. Kolja Haberland, chief technological officer of Laytec, went into details of in-situ wafers characterization. Physical homogeneity turns out in small LED binning and high quality product. Several parameters (substrate temperature, layer thickness, roughness, number of defects and wafer bowing) affect the final wafer quality and consequently the emission property of the LED. Thus a continuous online check of such parameters provides the information for close-loop control and consequent feedback for the reaction.

The higher control on the crystal growth parameters allows to scale up the production and saving cost through a large yield. And cost saving is one of the most sensitive themes in the LED market! According with Alexander Loesing, co-founder and chief marketing officer at Azzurro Semiconductors, the LED market is characterized by a strong price competition. On the other side the \$ per lumen is still too high. This situation partially hinders a large mass consumption and preserves a worldwide overcapacity. The market configuration tends also to promote the large players, that become even bigger enlarging their production and integrating their production through the value chain. Many examples were reported: Samsung, Epistar, Toshiba, Cree, etc. Similar consideration were reported by prof. Wang N Wang, chief science officer at IQE. Both of them indicate the silicon wafer as valid alternative to Sapphire for GaN growth in the perspective of cost saving. The economical advantage is not just related to the cost of the material but take advantage of a different and more consolidate (and amortized) platform. On the other side the technology of GaN on Silicon is more recent and, with some extend, more complex, thus a careful consideration of plus and minus has to be taken into account.



Presentation theatre located on the exhibition showfloor



A different point of view on the LED business was offered by, Dr. Calogero Sciascia, senior scientist in SAES Group, who presented a relevant and somehow under-estimated aspect on solid state industry related to contamination and degradation issues. In this context, he presented the role of active barrier and the getter materials for preserving the unique optical properties of both organic and inorganic light emitting diodes. In his talk, Dr. Sciascia also presented the shape memory alloys as possible candidate for miniaturized actuator for LEDs.



Networking at Ingo Maurer lighting showroom. Lee (EPIC), Adragna (STMmicroelectronics), Sciascia (SAES)



The EPIC Technology Session was part of the overall event programme

To complete the picture, Claudio Adragna, director of application and system architecture at STMicroelectronics, introduced the role of power conversion in solid state lighting. The apparently simple task of wiring the LED to the mains is actually a complex activity driven by the same constraints of energy efficiency, lifetime, integration, cheapness and modularity acting on the LED itself. LEDs' safety is also partially addressed to the electronic circuitry and in ultimate analysis many of the "smart" properties attributed to the LEDs are actually implemented at driver level.



Exhibitors at Stategies in Light Europe



For additional information, please contact the author of this event report:

Calogero Sciascia, Senior Scientist
Saes Group S.p.A.
Viale Italia 77, 20020 Lainate (MI) - Italy
Tel. +39 02 93178317
Calogero_Sciascia@saes-group.com
www.saes-group.com



The SAES Group is a world leader in a variety of scientific and industrial applications where high/ultra-high vacuum conditions or pure metal vapors or ultra-pure gases are required. Starting in 2004 the Group has expanded its business into knowledge-intensive materials markets, in particular the market of NiTiNOL, whose super elastic properties are applied to medical devices while shape memory properties are applied in industrial and consumer electronics applications. For more than 70 years, our technology has been supporting innovation in the following sectors: i) Information and Displays industry, ii) Lamp industry, iii) Vacuum and Ultra-high Vacuum applications, iv) Vacuum tubes and electronic devices industry, v) Ultra-high gas purification for Semiconductors, vi) Renewable Energies area. Since 2004 our NiTi smart materials solutions have been innovating: i) the Medical devices industry, ii) the Consumer electronics industry, iii) the Automotive industry, iv) the White Goods and Domestic industries. The Group is also developing a wide range of advanced polymer-matrix composite materials for the encapsulation of OLED Displays, OLED Light Sources and other Organic Electronics and Organic Photonics devices. www.saesgroup.com



About EPIC – European Photonics Industry Consortium

EPIC is a membership-led not-for-profit industry association that promotes the sustainable development of organisations working in the field of photonics. Our members encompass the entire value chain from LED lighting, PV solar energy, Silicon photonics, Optical components, Lasers, Sensors, Displays, Projectors, Optic fiber, and other photonic related technologies. We foster a vibrant photonics ecosystem by maintaining a strong network and acting as a catalyst and facilitator for technological and commercial advancement. EPIC publishes market and technology reports, organizes technical workshops and B2B roundtables, advocacy and lobbying, education and training activities, standards and roadmaps, pavilions at exhibitions. www.epic-assoc.com

EPIC Members (1 February 2014)

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