

OUR OLED INSIDER

David Morgan gives a product designer's view on this year's OLED Insider conference and asks if the OLED road map is going nowhere

At the OLED Insider Summit in London recently a number of OLED panel manufacturers stood before an audience of lighting designers and luminaire manufacturers to vaunt the paradigm-shifting, world-changing potential of their product. Each stressed that they were offering a glimpse of the future. If this is true, the audience was non-plussed. This particular version of the future looks rather boring and flat.

The current state of the art OLED panels are still at the novelty stage: very expensive small glass-based panels that are inefficient, fragile with quite short life. They emit a fairly pleasant, if boring, flat white light quality. But what of the future? Since inorganic LEDs are now incorporated into thin and efficient lighting panels, what, one may well ask, is the point of pouring money into OLED technology?

In a well-argued presentation by Dr Geoff Archenhold the medium-term future of lighting is predicted to be based on LEDs, with OLED and inorganic LEDs steadily increasing market share over traditional light sources as costs fall and efficiency rises. The open question is the market share each LED technology will gain over a 10 to 20 year period.

The most articulate of the sceptics, Ian Ruxton of Speirs and Major, pointed out that the development road maps of the OLED manufacturers could be leading nowhere unless there was a suitable significant lighting application in mind and he could not see what that might be at the moment. He concluded that OLEDs were more of a

light-emitting building material than a lamp or light source and that OLEDs could play little more than a supporting role in lighting other than in niche applications such as furniture and decorative luminaires. He stated that he could not currently see any killer applications that would support the investment being made in OLED.

Unless the production technologies improve rapidly so that OLEDs can compete with inorganic LEDs, what kind of lighting applications would justify the investment made to produce them?

Over the next year or two, it was predicted by the speakers that OLED panels will become somewhat larger - up to 200 x 200 mm, more efficient - up to 50 lumens per Watt, with a longer life of up to 10,000 hours to 50% initial lumens and will be available in colour changing versions. However, they will still be very expensive, made of glass and have very limited applications beyond decorative, emergency and novelty lighting. To make OLED lighting elements easier to integrate into luminaires several of the manufacturers including Philips and LEDON will be producing the panels in modular form that will snap into a holder without the use of solder.

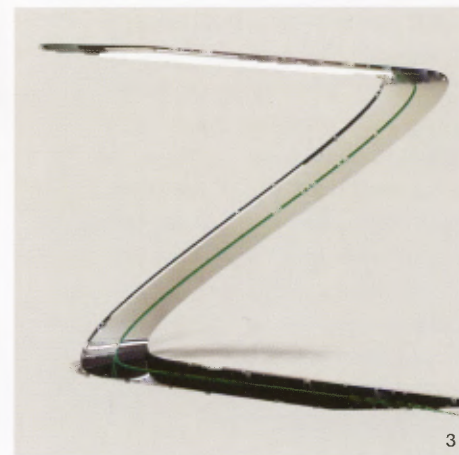
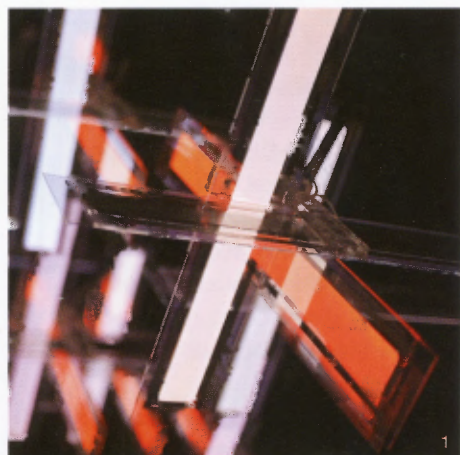
So far this does not sound very exciting but the holy grail of OLEDs is their production on a flexible plastic substrate by a roll to roll printing process. When this happens the cost of OLEDs will fall dramatically and the potential applications will therefore increase.

GE were the only OLED manufacturer at

this event claiming to be close to producing flexible, polymer based materials using a roll to roll printing process with reasonable efficiency and life expectancy. GE's Andy Davies explained how they had been working for the past ten years to integrate their expertise in plastic materials and lighting. Their material that was shown at various lighting trade shows this year will be introduced in 2011. Although all the other OLED panel speakers were sceptical about producing flexible materials within a five to ten year time period GE feel they have overcome problems in making the barrier material resistant to water and oxygen transmission - apparently the key issues to ensuring long life. Working with their partners at Konica Minolta in Japan the material will have a life of up to 10,000 hours before light output falls to 50%. Efficiency will be 50 lumens per Watt with a CRI of 80 and a surface brightness of 1,000 nits. GE envisage signage as being one of the key initial applications but that it would migrate into more general lighting along with other LED technologies in due course.

Geoff Williams who runs the polymer OLED project for Thorn Lighting in the UK claimed that 200 million m² of office fluorescent lighting is replaced every year in the EU. If OLED can gain even a small percentage of this market then the polymer OLED materials that he is working on would have a viable future with a market of perhaps 10 million m² within 10 years. He anticipates that OLED materials will meet fluorescent T5 performance by 2016 to 2018. However

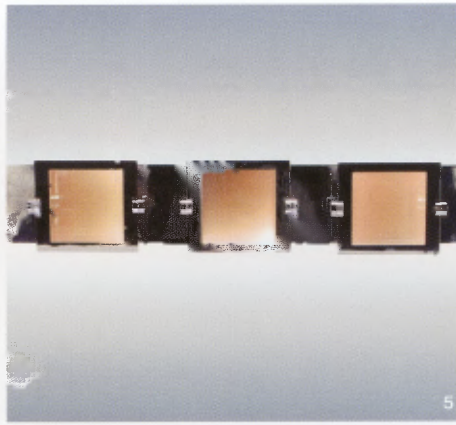
1 MGR chandelier, designed by C+B Lefebvre using Blackbody OLEDs 2 Modular Lighting Instruments' O'Leaf uses Philips Lumileds panels 3 Edge from Established & Sons, a decorative desk lamp incorporating Lumileds





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4 Acuity Brands' design uses OSRAM OLEDs. 5 At this year's Lightfair, WAC Lighting exhibited an OLED Bath Bar Lighting Fixture prototype featuring transparent OLED panels from Novald. 6 Light Photon was created by Philippe Starck for Flos, using Blackbody OLEDs 7 NovaLED' Palm Frond ceiling and floor lamp 8 Osram's Light + Building stand included special room designed by Andreas Schulz at LichtKunstLicht reflective panels that including Orbeos OLED by OSRAM Opto Semiconductors 9 Commissioned for Milan Furniture Fair 2010, Jason Bruges Studio used Lumileds to create Mimosa a piece with petals that close in response to visitors

since inorganic LEDs are almost at this level now it may be that OLEDs will only capture a small area of this market.

The only presentation by a mainstream luminaire manufacturer at the event was from Peter Ngai from Acuity Brands (Lithonia), the largest luminaire manufacturer in North America. Peter is a keen advocate of OLEDs and presented a couple of concept OLED pendants at Lightfair in May this year using the Osram Orbeos panels. His view was that the technology was still immature but that the light quality was potentially it's strongest selling point, feeling that the light had a noble quality, if the efficiency, cost and life could be improved dramatically. OLED manufacturers had a short window of opportunity to improve their products before alternative flat panel approaches based on inorganic LED would make OLEDs irrelevant for mainstream lighting.

Ingo Maurer and his colleague Bernhard Dessecker who were very early adopters of OLED panels spoke about their experiences and showed their latest creations that combine inorganic LEDs with the OLED panels in an attempt to make the lighting effect more interesting. While they felt that OLED light had a more spiritual feeling than traditional light sources it also had no sex appeal as it was so flat.

The boringness of the OLED light quality was also echoed by Bruno Dussert - Vidalet from Blackbody, the French manufacturer of the Philippe Starck designed OLED task light marketed by Flos. Apparently Philippe Starck also finds the quality of light from OLED panels to be boring and the technology incomprehensible.

Jonathan Hodges from Jason Bruges studio and Hannes Kotch from Random both presented interactive artworks that utilised the Philips Lumiblade panels. While fascinating and attractive these highly expensive pieces were so far from the high volume

applications that the OLED manufacturers are seeking.

The luminaire and OLED manufacturers who came to the conference hoping to gain specific product design ideas went home disappointed - perhaps some ideas did emerge during the conference but if so then they were being kept well under wraps by those creating them.

Probably in 10 to 15 years time OLED panels will be large, flexible, efficient and cheap with a long working life but will we be using them to replace T5 linear fluorescent lamps for office lighting? This is the key market for OLEDs to capture but perhaps further developments of current inorganic LED technology will be a more cost effective solution.

The feedback from the lighting designers as to what to do with OLEDs was mixed. Several showed stills from Kubrick's film 2001 of illuminated floors and ceilings as an ideal OLED application while others showed exactly the same images as being the kind of application to avoid at all costs. Those designers with the longest experience of working with OLEDs including Ingo Maurer and the Philips luminaire design team have started to combine OLED with inorganic LEDs in the same luminaire in order to make the light more interesting and modulated so this may be a clue to the shape of things to come.

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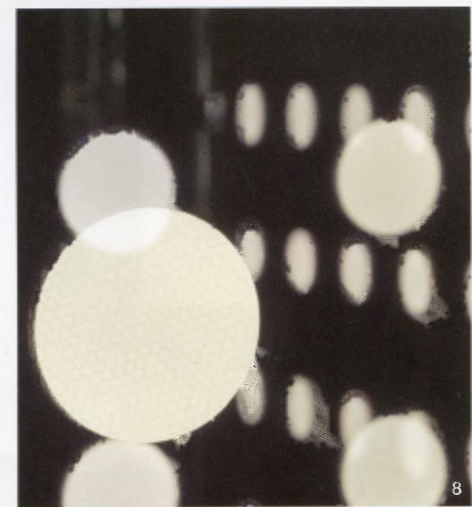
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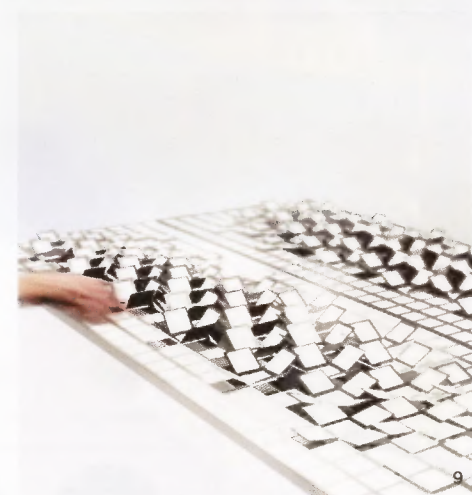
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