LUMIBLADE CREATIVE LAB

The OLED Lighting Magazine

LUMIBLADE CREATIVE LAB
Explore: come play with us

TOM DIXON
Flat Lamp: a unique collection of OLED light bulbs

MODULAR LIGHTING INSTRUMENTS
O'Leaf: where top-notch technology meets high-end design

JASON BRUGES
Engulfing: OLEDs sparkling above Aston Martin's One-77

ESTABLISHED&SONS
Edge: a light completely reductive in its simplicity

LUMIBLADE LIVING SHAPES
Interactive: the modular OLED lighting installation

PHILIPS

"Light is a holistic part of architecture, a beautiful dimension of space. Light brings comfort and inspires. Imagine how Lumiblade enables such light, and how it, in the hands of designers, lets simplicity and beauty come together."

Rogier van der Heide, Chief Design Officer Lighting @ Philips

Dear Reader,

Welcome to the OLED Lighting Magazine! Within the Philips Lumiblade Creative Lab, we have spent the past year exploring the many uses of OLED lighting together with numerous creative minds. More than just an abstract design concept, our Creative Lab is a real workshop, in Aachen (Germany), where experts in the fields of lighting, electronics and materials are on hand to advise you how to integrate light and hence add a new dimension to your projects.

On the following pages, you will be able to see just what happens when you succeed in bridging the gap between technology and creativity. We are sure you will agree that the projects outlined in this magazine open up a whole new world of opportunities for working with light. Functional as well as decorative, and surprisingly easy to use, organic lighting represents a new raw material for you to use in your design process.

Over the past months, we have been repeatedly excited and amazed by what our partners have created with Philips Lumiblade in our Creative Lab. One thing we have learned is that the possibilities are endless, limited only by your imagination. If this magazine has inspired you to take a new approach to light, we hope you will allow us to accompany you on this journey of exploration. The team at our Creative Lab is ready to help you turn your innovative design ideas into reality. Come play with us!

Your Lumiblade Team

CO-CREATE THE FUTURE WITH LUMIBLADE OLEDS

Philips Lumiblade is more than just another light source – it is a highly-adaptable material that removes the boundaries of shape and size associated with conventional lighting. It offers incredible potential to change the way we use light to shape objects and architecture.

The Lumiblade Creative Lab brings together professionals from a wide range of creative backgrounds, inviting them to experience – and experiment with – Lumiblade for themselves in the fully-equipped workshop. It is a journey of discovery, a meeting of creative and technical minds, to explore the wide-reaching potential of OLED lighting in design and construction.

The Creative Lab team offers advice and guidance as well as practical support, helping your project to progress beyond the design stage into a prototype or even entering production as a small series. The products contained on the following pages are prime examples of how Creative Lab has already succeeded in turning ideas into reality.

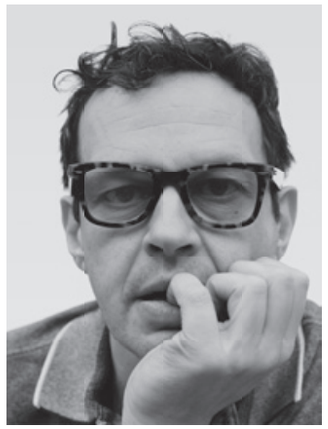
To find out more, and help us to co-create the future with organic light, talk to the members of our team or visit www.lumiblade.com.

LUMIBLADE **CREATIVE LAB**

COME PLAY WITH US

FLAT LAMP

Philips Lumiblade has collaborated with Tom Dixon to develop 'Flat Lamp', a unique collection of OLED light bulbs. A true first in the next generation of illumination, OLEDs provide ultra-thin, consistent, energy-efficient and sustainable lighting. The Flat Lamp is a typically direct and succinct interpretation of this new, exciting technology and the collection includes three different shapes: Square, Round and Strip.



"Our collaboration with Philips has been nothing short of illuminating, being able to work on the cutting edge of technology in a field that has such a big impact on people's everyday lives. For us it's a dream project where the objective is to be at the forefront of reducing energy consumption whilst illuminating spaces both more attractively and more functionally. OLEDs are going to change the way that designers, architects and the general public use light, and we are delighted to be the designers of the world's first integrated OLED bulb."

Tom Dixon

Picture courtesy of Aston Martin

ENGULFING THE ONE-77

Jason Bruges used Lumiblade OLEDs again for a light installation that caused just as much sensation as his previous OLED-installation "Mimosa". This time he incorporated approximately 800 OLEDs in an out-of-the-ordinary showroom of the British sports car producer Aston Martin. Here, the OLED light sculpture is employed in the handover of a very special car: the Aston Martin One-77. Resembling an orchestration of the highest standard, a completely dark room initially awaits the new owner. By and by, the OLED installation by Jason Bruges immerses the super sports car in flickering light, revealing more and more of its contours. In the process, the OLEDs reflect like stars on the ONE-77's handcrafted aluminum body, which furthermore turns on its own axis atop a revolving stage. The result: a breathtaking super sports car, breathtakingly illuminated and staged.

"Jason Bruges Studio enjoys working with Philips Lumiblades because of their incredibly slim profile and fantastic, even light quality."

Jason Bruges

O'Leaf Wall

O'LEAF

Form follows technology – in this case, the design of the fixture required to take OLED technology to the next level. The form of the fixture is inspired by the organic shapes that are increasingly found in the world of design. The word 'organic' is particularly appropriate, both to the OLED technology by Philips Lumiblade and to the range of O'Leaf by Modular. The O'Leaf family contains different functional fixtures: O'Leaf wall, O'Leaf ceiling, O'Leaf table and O'Leaf floor.

"Sleek intelligence where top-notch technology meets high-end design."

Wim Gielen – R&D Manager

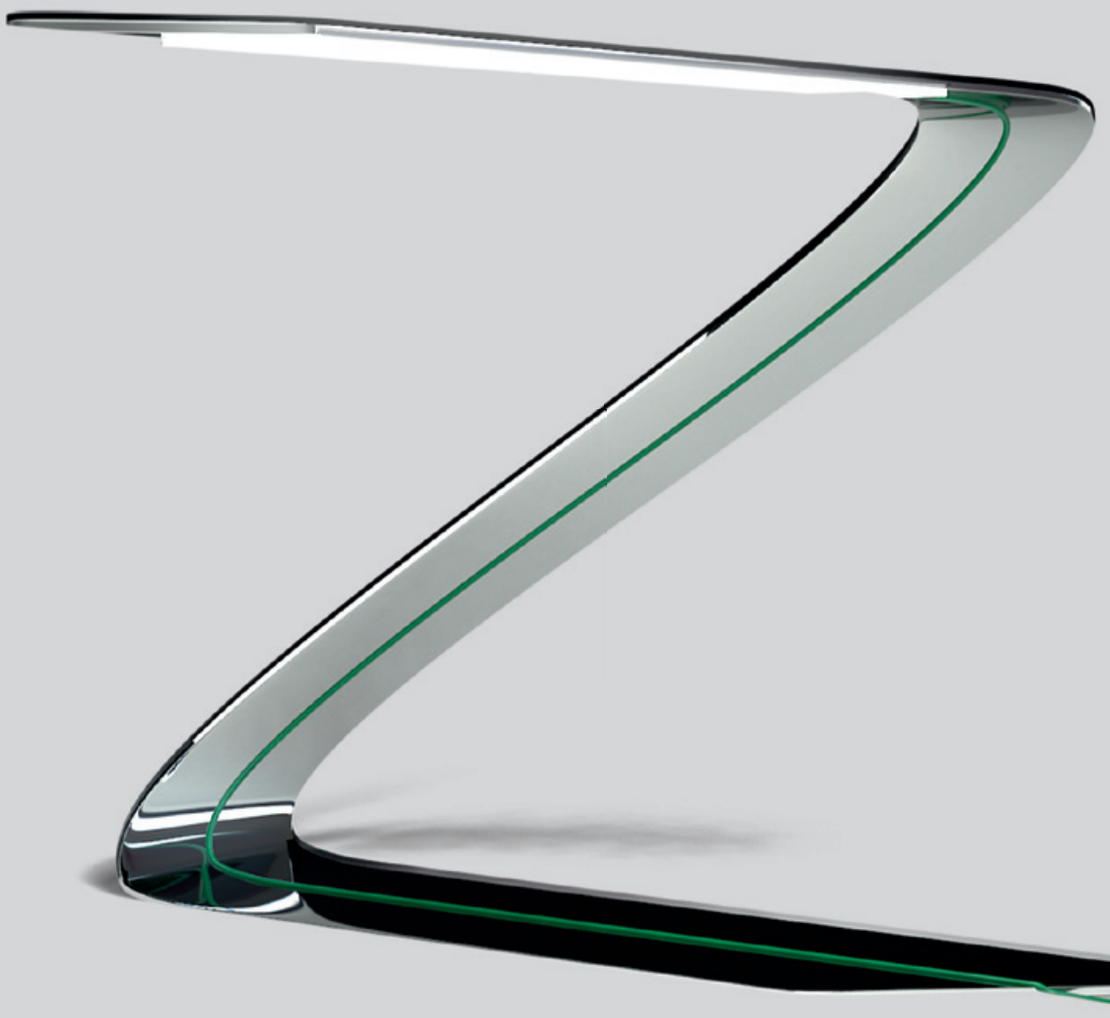
EDGE

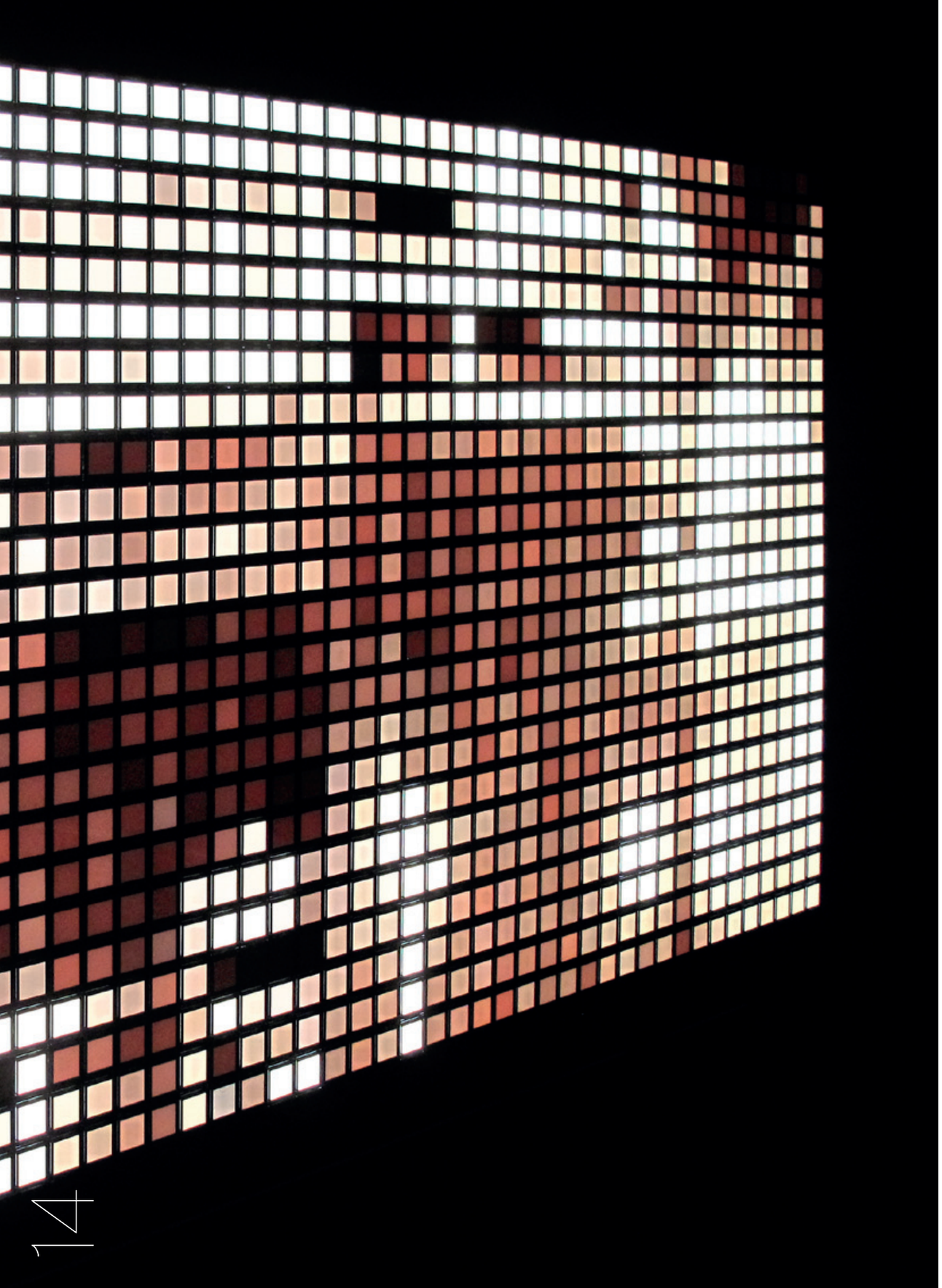
Edge is driven by a desire to exploit a technology that is in its infancy but is destined to change the way we see light. Dubbed 'the new lighting technology of the 21st century', Lumiblade OLEDs give no flickering of light, no glare and no excessive heat emission. Instead, there is simply a subtle sheen of light. Levete wanted to reveal the wafer-thin essence of OLEDs and create a light that is completely reductive in its simplicity. A flat ribbon of steel is twisted into a self-supporting form. A groove is then cut into the steel, off centre, to allow the cable to be expressed and to exaggerate the movement of the piece.

Amanda Levete

Celebrated for her creation of innovative structures, unique application of construction materials and courageous architectural schemes, Amanda Levete, as a founding partner of much renowned architectural practice Future Systems, has established a particularly impressive reputation as one of Britain's leading creatives. Having left the practice in 2009 and set up Amanda Levete Architects, Levete's ability to challenge traditional pre-conceptions of space continues to characterise her work.

Established & SONS
Great Britain





LUMIBLADE LIVING SHAPES

PLAYING WITH LIGHT

Lumiblade Living Shapes is the perfect example of how beautiful light can be. And especially how interactive it can be too. Living Shapes captivates the beholder already when entering the lobby or the hall where it is on display. Movement there is translated into impulses that illuminate the numerous Lumiblade OLEDs, bathing the room in an atmospheric light. This is the very light that makes the new lighting technology so distinctive. Even when all the OLEDs are alight, the light is warm and pleasant rather than glaring. Lumiblade Living Shapes is based on an ingenious modular design. Instead of having to link hundreds of OLEDs together one by one, users rely on integrated OLED panels. Designed as a plug-and-play system, numerous panels can be arranged either side by side or on top of one another, thus quickly creating an illuminated surface of several square meters.

REFLECTIONS

YOU ARE MY FAVORITE MIRROR

OLEDs emit light in the on-state and appear as mirrors in the off-state. Exploiting these characteristics to full effect, Lumiblade Reflections is an Illuminated panel of light made up of dozens of OLEDs.
Working on infrared sensors, some Lumiblades switch off to reflect the image of a person or object while others remain on, surrounding the reflection in light. Lumiblade Reflections is more than just a mirror.
It is a light installation that positively captivates the beholder with the beautiful, natural light from OLEDs. It is a mirror that shouldn't just be confined to the bathroom either, as Lumiblade Reflections also comes into its own in the hallway or next to the cloakroom.

SAY HELLO TO THE NEXT GENERATION OF LIGHT

Lumiblade is an organic lighting system with an output and lifetime to match conventional lighting but with easier installation, increased flexibility and with better energy efficiency in the future. As Lumiblade opens up a world of possibilities in design, welcome to a new raw material: light.

Maximal system efficiency

Due to its spherical distribution, the light output of the OLED is the effective output of the luminaire itself. Lumiblade currently demonstrates an energy efficiency equivalent to halogen, making it suitable for similar decorative applications. As the technology continues to be developed, Lumiblade is expected to become more efficient than energy-saving lamps, eventually generating up to 140 lm/W – in other words, 15 times more efficient than conventional light bulbs.

Any kind of material

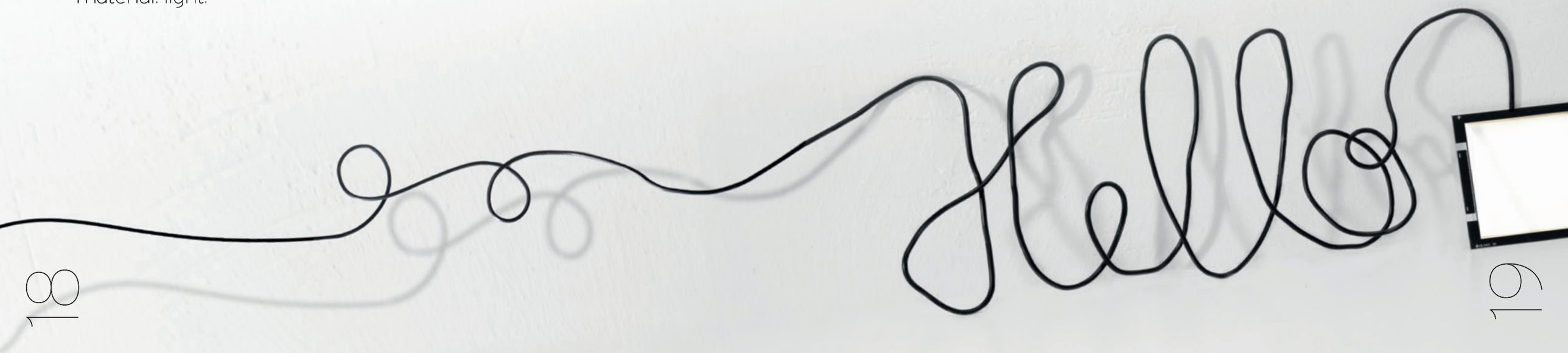
Lumiblade is flat, remarkably thin (less than 2 mm thick) and its heat is distributed evenly across its surface area, making it ideal for use with virtually any type of material – glass, wood, textiles, etc. This provides designers with almost endless possibilities to work Lumiblades into a range of objects, surfaces and situations, whether furniture (tabletops, chairs, shelving), clothing or rooms (walls, windows, ceilings). Blurring the boundaries, ambient lighting can become an integral part of an item or building, and designers can use light itself to define the shape of objects or spaces. With a potential lifetime of several tens of thousands of hours, Lumiblade can be integrated into designs, whether for functional or decorative purposes, without concern that it will need to be replaced within an object's useful lifetime.

A world of color

Not only an innovative light source, Lumiblade is also a colorful and creative medium of expression. Available in almost any hue, it offers fantastic color rendering and variable brightness, as well as being instant-on and dimmable. Lumiblade allows you to create an endless range of lighting effects for your projects. You now have the freedom to experiment with shapes, patterns, vibrancy and color, and to combine the results with almost any material you choose.

The future is clear

In the off-state, a Lumiblade currently appears as a mirror, but we expect Lumiblades – including the substrate, light-emitting materials and electrodes – to be fully transparent in just a few years from now. The development of a completely clear Lumiblade will result in even more opportunities for the creation of innovative new products: glassware transformed into an ambient light source, or windows that let in sunlight during the day and emit gentle indoor lighting at night. Needless to say, the possibilities are endless.

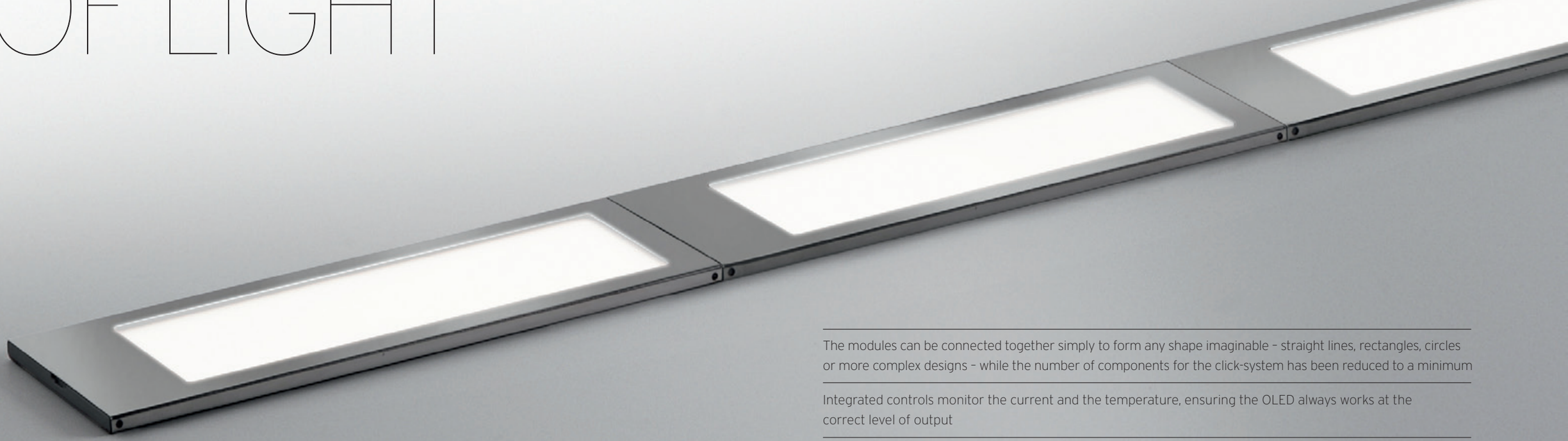


OPEN YOUR MIND TO THE POSSIBILITIES OF LIGHT

The Philips Lumiblade OLED module is, just as the name suggests, a modular, ready-to-use product, incorporating all the necessary electrical controls – enabling you to integrate OLED technology into your design projects, easily and effectively.

Minimum electrical fuss – the OLED will not work without the controls but, from now on, there is no need to give a second thought to the technical aspect.

The Philips Lumiblade module bridges the gap between cutting-edge technology and creative design. No longer restricted by technical limitations, you can open your mind to the possibilities of light, and discover how OLEDs can work in your projects and designs. This innovation opens up a range of exciting possibilities, now and in years to come. Our team at the Creative Lab is on hand to provide any support you might need – creatively or technically – to integrate OLED technology into your project. Embrace the new opportunities and, we are sure, the Philips Lumiblade module will represent just the first step of many.



- The modules can be connected together simply to form any shape imaginable – straight lines, rectangles, circles or more complex designs – while the number of components for the click-system has been reduced to a minimum
- Integrated controls monitor the current and the temperature, ensuring the OLED always works at the correct level of output
- Built-in safety features prevent overheating or other potentially hazardous situations

WHAT IS LUMIBLADE?

Lumiblade is OLED lighting at Philips. Lumiblade is a large-area diffuse light source. Unlike incandescent bulbs, which generate light by passing electricity through a wire, or fluorescent lamps, which pass current through a gas, OLED lighting works by passing electricity through one or more extremely thin layers of organic semiconductor material. These layers are sandwiched between two electrodes – one positively charged and one negatively. The 'sandwich' is placed on a sheet of glass or other transparent material which, in technical terms, is called a 'substrate'. On the rear side, the OLED is protected by a cover glass. When current is applied to the electrodes, they emit positively and negatively charged holes and electrons. These combine in the organic layer of the sandwich and create a brief, high-energy state called 'excitation'. As this layer returns to its original stable, 'non-excited' state, the energy flows evenly through the organic film, causing it to emit light. Using different materials in the organic films makes it possible for the OLEDs to emit different-colored light.

IS OLED TECHNOLOGY ALREADY AVAILABLE IN DISPLAYS ?

Display and general lighting applications share the same underlying technology: OLED. Up until now, this technology has only been industrialised for high-end display applications, such as displays on MP3 players or mobile phones, or the latest generation of televisions. Philips started to develop this technology for lighting applications several years ago, as scientists discovered that it could also be an energy-saving light source. However, there are some essential differences in the requirements depending on the applications. Challenges for lighting are the large-area diffuse light output, higher brightness levels, longer lifetimes and good quality of white and mixed colors. OLEDs for lighting applications do not need high resolution with small pixels – instead, they need a good homogeneity of emission over the complete surface.

WHAT IS THE DIFFERENCE BETWEEN OLEDS AND LEDS?

LEDs and OLEDs both generate light by semiconductors – basically by stimulating electrons in their components with an electrical charge. They also share the ability to create color effects that go beyond the ability of incandescent lamps and the potential to become extremely energy-saving light sources. But there the resemblance ends. There are numerous differences between LEDs and OLEDs in their make-up, the type of light they produce and the way they can be used. Organic compared with inorganic key structural difference is that OLEDs are created using organic semiconductors, while LEDs are built in crystals from an inorganic material. The ways in which molecules can combine and interact in organic materials are much more extensive than in inorganic materials, which significantly increases the development potential for OLEDs. Point light sources compared with diffuse light sources LEDs are very condensed light sources which create a very high level of brightness in a compact shape. They are perfect to be aligned with optical systems and form sharp, well-controlled beams. OLEDs, however, are diffuse light sources by nature. They emit a soft cloud of light and are well suited for creating a sense of atmosphere and ambience.

WHAT CAN LUMIBLADE OFFER TODAY?

At the forefront of OLED technology, Philips Lumiblade demonstrates unique characteristics and capabilities that can redefine lighting, and the way we use and experience it: its homogenous output, unusual appearance, low heat emission, extremely flat nature and high degree of controllability. These factors open up endless opportunities to create groundbreaking new lighting concepts and experiences, which will in turn provide consumers with dramatic and unexpected ways to create atmosphere in a room. Available in various sizes and colors, Lumiblade panels can currently measure up to 50 cm². In addition to symmetrical panels, other shapes such as oval, round and free forms are possible too. Color tunability is already shown in the labs. However, today's Lumiblades are available in all colors, upon request. The colors emitted are produced by mixing RGB molecule materials so that even specific color shades can be created.

Environmentally-friendly

OLEDs are not only an extremely appealing light source, generating a harmonic, large-area light output, but they are also environmentally sound: the potential energy-efficiency will save energy and reduce the emission of dangerous greenhouse gases. Since OLEDs do not contain hazardous substances, they are also easy to recycle. Moreover, these extremely flat luminaires take up very little space, leading to low packaging, transport and storage costs.

Performance

The current Color Rendering Index CRI of 80 is comparable to other light sources in the same category of application, where colors must be recognised well, and it is improving constantly. Actual efficiencies vary according to the individual color in question. As is the case in LED technology, blue emitters still have room for improvement, while green and red are highly efficient. In white, Lumiblade provides up to 20 lm/W. In terms of the lifetime, the brightness is the determining factor. At up to 3,000 cd/m², Lumiblade achieves lifetimes of up to 15,000 hours (at 50 % of initial brightness).

Applications

Because Lumiblades are extremely flat panels that emit light evenly over the complete surface, the illumination they produce is 'calmer', more glowing and diffuse, and non-glaring. The thin, flat nature of the panels also makes it possible to use and integrate light in ways that are not possible with any other lighting sources. OLEDs represent a welcome addition to the Philips family of light sources, providing even more choice and freedom of creative expression in an increasingly energy-conscious world. Can Lumiblade be transparent? Transparency in the off-state is perceived as a very attractive product feature, because so far no material can make glass glow, without being visible in the off-state. The first prototypes of transparent Lumiblades are already in the labs, but we expect it to be several years before this is developed into a commercially-viable product.

IS LUMIBLADE FLEXIBLE?

We are currently working on the development of flexible OLEDs. Flexible polymer OLED displays are already on the market, but small molecule OLEDs for lighting applications are still in the research phase. We expect this to be industrially available within four to six years.

Technical Data (commercially available today):
20 lm/W in warm white and RGB,
up to 3,000 cd/m² brightness,
up to 15,000 hours lifetime at 50 % initial brightness,
1.8 mm thin, <50 cm² surface.

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www.lumiblade.com

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