Organic Light Emitting Diodes

OLED lighting modules for your lighting application
“I want a light, which perfectly adapts itself to the style of my lighting application.”

Maria R., lighting designer from Milan
We devote all our energy to your light.

Light. Exploring it, understanding it, and creating new lighting concepts – this is Tridonic’s core expertise. For more than 50 years we have been turning your ideas into light. Today, some 2,000 experts all over the world put in all their creativity to develop cutting-edge technologies to be used for the control and operation of innovative lighting systems; and they are doing it with great passion, in cooperation with you.
With 30 branch offices and partners at 73 locations all over the world, we are always close to you.

There are three things you may rely on when it comes to Tridonic: top-quality products, decades of expertise, and our commitment to flexibly support you.

Some 2,000 staff members all over the world use all their know-how and creativity to ensure that you are provided with the perfect light.

Each year, we devote more than 1,000 training days to the further education of those of our staff members that are vested with functions close to the market.

Tridonic’s extraordinary power of innovation is documented by a large number of patents and inventions.
High-quality light generation and extremely flat: OLED lighting modules from Tridonic

Start into the next era of lighting with us: With Tridonic’s organic light emitting diodes you design your innovative lighting application – homogeneous, area light and in an extremely thin design.

By launching innovative OLED lighting modules in the Tridonic product portfolio, we live up to our aspiration to be an internationally recognised innovation partner for luminaire manufacturers and project partners.

With our OLED product portfolio we offer you the perfect combination of new light technology and an innovative integration solution for your application – you will find the right functionality for every requirement.

We provide you with an OLED module system, which is characterised by optimum interaction of optics, mechanics and electronics. This means you obtain an integrated OLED lighting solution out of one hand.
Light emitting diodes have a very bright future. The potential is huge and the possibilities endless. The OLED technology opens up new perspectives in the design of future-oriented lighting systems.

Enormous potential for a bright future
OLED technology

In contrast to LED point light sources, organic light emitting diodes (OLEDs) are still in their infancy. This relates to their technical properties such as luminous efficacy and lifespan but also to the cost of OLED elements. Even today, however, it is possible to see the huge potential of OLEDs for new luminaire designs and as a source of inspiration not only for classic luminaire manufacturers but also for lighting designers and artists. The possibilities of these light sources go way beyond the classic applications – everything from designer luminaires and accent lighting to office lighting – opening up a much greater application scope.
OLEDs are suitable for a wide range of products in which light can be incorporated – as transparent lighting elements in windows to replace natural daylight, as thin lighting elements in walls for enhancing the look of architecture or as an integrated part of furniture or room dividers. These are certainly fascinating lighting solutions and there is still plenty of scope for visionaries.

What’s more, OLEDs with their area light and LED point light sources offer enormous potential for energy-efficient lighting and can therefore help meet the requirement of the European Council to reduce CO$_2$ emissions in Europe by at least 20% by the year 2020.
Brilliant and absolutely flat
From the purely technical point of view, both OLEDs and LEDs are semiconductors that convert electric current into light. While LEDs produce a point of light based on a tiny light-emitting chip, OLED panels are an area of diffuse light. Several differently doped organic semiconductor layers are vapour-deposited on glass between an aluminium electrode as the cathode and an indium tin oxide (ITO) anode. Current flows through this “stack” between the two electrodes. The light colour can be influenced according to the materials chosen and the doping of the layers.

The entire light-emitting layer of an OLED is around 400 nm thick – that is one hundredth of the thickness of human hair. In all, the area light source has a thickness of less than 2 mm.

When they are switched off, OLEDs may be mirroring, neutral white or transparent, depending on the basic material. In addition to OLEDs on rigid carrier material such as glass, flexible versions will be developed in the near future. The challenge here is that the entire system must be absolutely air-tight and water-tight – right throughout its life.

To limit the voltage drop, several OLEDs are connected in series to create larger areas. At the present stage of development, it is best to limit the size of the individual elements to no more than 100 mm x 100 mm to 300 mm x 100 mm. The result is what is known as OLED tiles.

OLED modules are characterised by glare-free light and uniform luminance distribution, small mounting heights and simple robust connections. The light source emits heat across its entire surface so there is no need for a heat sink. Even heat-sensitive objects can therefore be illuminated safely. At a CRI between 80 and greater than 90, colour rendering is excellent. A broad spectrum of light colours can be produced by doing the semiconductor layers appropriately.
Natural colour rendering
The warm white light of OLEDs has a broad wavelength spectrum and excellent colour rendering with a CRI up to above 90.

Area lighting
Organic light emitting diodes are the first genuine area light sources. They produce high-quality diffuse light with no glare.

Low-profile design
OLEDs provide the basis for extremely thin, lightweight and, at some stage in the future, large-scale lighting solutions, only 2mm thick and with excellent uniformity.
At a glance: OLED

- Uniform glare-free light
- Extremely low-profile design
- Excellent colour rendering
- High efficiency
- High luminance
- Area light source
- Low weight
- Low surface heating
A wide range of applications

OLED modules offer so many possible applications, including ones that have not even been conceived yet. Thanks to their simple control, they are suitable not only for ultra low-profile luminaires but also for a wide range of intelligent lighting solutions – everything from dimming to scenario programming. OLEDs with transparent surfaces, in addition to those with milky diffuse surfaces, hold out the promise of some unusual lighting installations. For example they could be integrated in mirror systems.

Since OLED-based luminaires do not need any reflectors the luminous efficacy of the surface is the same as that of the entire system. There is also no need for lens systems which point light sources require in order to distribute the light. Semiconductor light from diffuse area light sources have the potential for providing the basis for fascinating and highly efficient lighting systems characterised by a complete lack of glare.

OLEDs have huge potential in a large number of applications. They are extremely thin and can be manufactured in almost any shape on substrates. This exceptional versatility in terms of design and application makes them very attractive to designers, luminaire manufacturers and end users. We will know in the near future what output can be expected from these area light sources. However, a few OLED luminaires have already been designed that demonstrate their possibilities.

Design potential

With OLED panels it is technological possible to create free-form lighting or in the future on flexible carrier materials. There is no need to be restricted to square formats. What’s more, predefined zones on the light-emitting surface can be individually controlled, making this type of light source suitable for display systems for example. Also, transparency or flexibility of the OLEDs provide further scope for creativity. Designers will have more freedom than ever before. The possibilities are endless.
Innovative lighting and design with organic light emitting diodes
OLED product portfolio

**OLEDmodule LUREON REP**
Efficient OLEDs for professional lighting applications. For more information on this product range, see page 14 et seq.

**OLEDmodule LUREON REM**
Flat design for more flexibility and lightness. For more information on this product range, see page 18 et seq.
Score a hit with new design freedom, surprising lighting applications, large area, homogeneous and highly efficient light sources: The extremely flat OLED modules smooth the way for you to draw up creative lighting concepts and to overcome conventions that have applied to date.

OLEDmodule
LUREON PURE

Pure light for unlimited lighting applications. For more information on this product range, see page 22 et seq.

OLED special

Customized OLED solutions. For more information to the customized possibilities, see page 26 et seq.
Efficient OLEDs for professional lighting applications
OLEDmodule LUREON REP

Maximum performance, combined with an efficient and unique light: The entry of organic light into powerful lighting applications begins with LUREON REP.
Light in new dimensions
The typical application areas of the LUREON REP product range include professional linear luminaires and square illuminated areas with all kinds of different dimensions. Different mechanical integration solutions simplify the implementation of large area and powerful lighting applications. Here too, adaptive driver systems ensure smooth integration of the lighting modules.

The OLED era for professional lighting systems has begun. With their innovative properties, organic light emitting diodes will enable completely new approaches and effectively supplement existing technologies.

For the highest standards
Light systems to date, which set high luminance and efficiency requirements, are now provided with decisive technological advantages – LUREON REP is the first product range with innovative OLED features, which can be used in professional lighting applications.

With the quadratic and rectangular shaped LUREON REP series, a fully integrated OLED module system is available with firstclass product properties. The system impresses through its high luminance and efficiency. This performance of the lighting module is also facilitated by optimised diffuse output coupling optics. The LUREON REP modules are used wherever a professional, homogeneous light is required.
Efficient OLEDs for professional lighting applications
OLEDmodule LUREON REP

**Optics**

**Highly efficient output coupling optics:**
The highly efficient output coupling optics support the result of a highly qualified lighting system and the white diffuse surface ensures a uniform and neutral appearance.

**High-quality light generation:**
Excellent colour rendering with a CRI up to over 90 and homogeneous, non-glare and area light ensure that LUREON REP produces a pleasant and agreeable light for people.

**Mechanics**

**Type:**
LUREON REP is available in a quadratic and rectangular design. Different shape factors enable individual implementation of lighting applications. Thanks to the slim form factor, there are no limits to the style of future luminaires.

**Contact:**
The modules are contacted via robust PCB contacts. There are two types of connection: Prefabricated connection cable (DL) or connection cable with plug-in contact (DC).

**Electronics**

**Converters:**
Suitable converters with different functions are available for the operation of the modules.
LUREON REP modules have made professional lighting applications using OLEDs possible for the first time.

▼ At a glance: OLEDmodule LUREON REP

- Efficient OLED modules > 50lm/W
- Different shapes allow an individual implementation of lighting applications
- Excellent colour rendering (CRI up to > 90)
- Dimmable neutral white light with 4,000 K (optional with 3,000 K)
- Homogeneous, non-glare and area light
- High luminous emittance up to 12,000 lm/m²
- Slim form factor of < 3 mm
- White diffuse surface for a uniform and neutral appearance
- Low colour angle shift (x, y ≤ 0,005)
- Small colour tolerance (MacAdam 4)
- Maximum utilisation of the illuminated area
- Adaptive driver system available
- Robust PCB contacts
Flat design for more flexibility and lightness
OLED module LUREON REM

The dimmable modules of the LUREON REM product range are captivating due to their extremely flat design: Used in filigree design luminaires or inconspicuous area lighting they skilfully highlight the OLED advantages.
More than mere lighting
The extremely thin design is a striking advantage of the OLED technology. At the same time, it causes us to look at the function of lighting systems to date in a completely new way. It is no longer merely a matter of the actual lighting. The flat LUREON REM modules are, for example, perfectly suited for integration in contract furniture or presentation walls – removing the need for external lighting of these objects.

Thanks to this new and definitely exciting design freedom, there are hardly any limits to the implementation of visionary ideas.

Flexible and extensive
Whether as a design orientated linear luminaire used in an office, as large area architectural lighting or as a completely integrated lighting ceiling or illuminated wall – the LUREON REM product range has primarily been developed for innovative lighting concepts.

Use of the LUREON REM products enables large area lighting applications to be achieved. The completely integrated OLED module system, with QUADRATIC and RECTANGULAR variants, impresses through its extremely flat overall height of less than 2.5 mm. Combination with an adaptive driver system very much simplifies use of the system in the respective lighting applications. LUREON REM offers the best preconditions for unique area lighting.
Flat design for more flexibility and lightness
OLEDmodule LUREON REM

**Optics**

**White diffusor:**
The white diffuse surface ensures a uniform and neutral appearance.

**High-quality light generation:**
Excellent colour rendering with a CRI of over 80 and homogeneous, non-glare and area light ensure that LUREON REM produces a pleasant and agreeable light for people.

**Mechanics**

**Type:**
LUREON REM is available in a quadratic and rectangular design. Different shape factors enable individual implementation of lighting applications.

**Backplane:**
The modules have a robust metal backplane for good heat coupling.

**Electronics**

**Converters:**
Suitable converters with different functions are available for the operation of the modules.
The flat LUREON REM modules offer the best preconditions for unique area lighting.

▼ At a glance: OLEDmodule LUREON REM

- Different lighting formats with a single connection for flexible module assembly
- Excellent colour rendering (CRI > 80)
- Dimmable warm white light with 3,000 K
- Homogeneous, non-glare and area light
- High system efficacy of 40 lm/W
- High luminous emittance of 9,000 lm/m²
- Slim form factor (< 2.5 mm)
- White diffuse surface for a uniform and neutral appearance
- Adaptive driver system available
- Robust metal backplane for improved heat contact
Surface lighting, integrated in a glare-free manner into an edgeless lighting module: The LUREON PURE system provides innovative design and area lightings of an almost floating airiness.

Pure light for unlimited lighting applications
OLEDmodule LUREON PURE
Smart and highly luminous
The LUREON PURE product range gives you the perfect symbiosis of form and function – the edgeless, extremely flat lighting module can be seamlessly integrated into design-oriented lighting applications. In this respect, LUREON PURE impresses with its constant and homogeneous luminance over the entire area.

Perfectly matched
Due to the low height and edgeless design, the module provides an impressive airiness. This allows stunning effects to be achieved through the arrangement of several modules. All the individual components of the rectangular or quadratic OLED system have been perfectly matched to each other. Depending on the application, different converters are available – either with or without a dimming function. Various mechanical holders or integration solutions tailored to customer requirements also facilitate the implementation of individual lighting solutions.

As well as pendant and design luminaires, lighting solutions for glass room-dividers or luminous wall elements comprising new forms and creative surfaces are also possible.
Pure light for unlimited lighting applications
OLEDmodule LUREON PURE

Optics

**Edgeless luminous area:**
The edgeless luminous area impresses with its homogeneous luminance, which renders a homogeneous, colour-constant light, independent of the viewing angle.

**High-quality light generation:**
Excellent colour rendering with a CRI of over 90 and pure, non-glare and homogeneous area light ensure that LUREON PURE produces a pleasant and agreeable light for people.

Mechanics

**Type:**
LUREON PURE is available in a quadratic and rectangular design. With a height of only 6 mm, the OLED module provides a floating airiness. This allows the arrangement of multiple modules to produce particular effects.

**Contact:**
The modules are contacted via robust PCB contacts. There are two types of connection: Prefabricated connection cable (DL) or connection cable with plug-in contact (DC).

Electronics:

**Converters:**
Suitable converters with different functions are available for the operation of the modules.
When mounted on the wall, the LUREON PURE modules combine design and lighting functions.

▼ At a glance: OLEDmodule LUREON PURE

- Pure, edgeless and homogeneous luminous field
- Low luminance reduction to the edge
- System efficacy of > 40 lm/W
- Excellent colour rendering (CRI > 90)
- Dimmable neutral white light with 4,000 K
- Non-glare and area light
- High luminous emittance up to 12,000 lm/m²
- Slim form factor of ~6 mm
- Low colour angle shift (x, y ≤ 0.005)
- Small colour tolerance (MacAdam 4)
- Adaptive driver system available
Customized OLED solutions
OLED special

**Innovative lighting and design with organic light emitting diodes**
With our OLED product portfolio we offer you the perfect combination of new light technology and an innovative integration solution for your application – you will find the right functionality for every requirement.

We provide you with an OLED module system tailored to your needs, which is characterised by optimum interaction of optics, mechanics and electronics. This means you obtain an integrated OLED lighting solution out of one hand.

Tridonic is your reliable partner for innovative and future-proof products. We work closely with our customers to find solutions, and develop and produce tailored solutions with considerable application expertise.
Manta Rhei – kinetic luminaire
The filigree LUREON REP modules were optimized so that the individual elements appear when switched off as small, frameless mirror. Nevertheless, the optimized mirror coating enables further a high quality light.

Additionally, the coupling of the control circuit has been prepared in order to allow an optimal integration into the luminaire.

DLR Next Generation Train
For the first time LUREON REP modules were equipped with a magnetic holder, which enables a quick and easy integration into the vehicle ceiling.

In order to ensure a secure mounting, the connectors were provided with a fall protection. In addition, a DALI-based control has been established.
Customized OLED solutions
OLED special

OPTICS

Mirror coated OLED

- Integration of frameless mirror coating for the sophisticated look even when switched off
- Ultrathin additional layer (< 1.5 mm)
- Homogenous colour distribution over all angles
- High efficiency of the mirror coated elements
- Reflectance is possible between 20 and 80 %

Round luminous area

- Round light emitting surface with round or hexagonal outer shape
- Dimmable warm white light with 3,300 K
- System efficacy of 35 lm/W
- Luminous emittance of 6,000 lm/m²
- Excellent colour rendering (CRI > 80)
- Slim form factor (3.5 mm)

MECHANICS

Magnetic holder

- Adapted holder for the easy integration of modules in applications
- Simple and safe mounting
- Low thickness of the total element
- Thickness of the magnetic holder ~ 2 mm
- Mounting safety factor > 4
**Double-sided luminous element**
- Monolithic both sides luminous element
- Separately dimmable light of both sides
- Low total thickness of < 5.5 mm
- High efficiency

**Special colour temperatures**
- Colour temperatures modified for special applications
- Excellent colour rendering (CRI > 80)
- Colour temperature variance < 4 Step-MacAdams

**OLED cluster**
- Monolithic connection of several modules
- High efficiency of the total element
- Low thickness of the total element
- Module thickness < 4 mm
- SELV series connection of the elements
- High aspect ratio

**Customized light integration**
Customized control and converter solutions are possible for the OLED modules. Besides various interfaces to lighting control systems, such as PWM, DALI or DMX, also additionally a sensor can be integrated.
Flexible light in a new dimension

Outlook

The term “flexible lighting solution” is generally used in terms of the adaptability of a solution within a room. As first bendable light source, the flexible OLED lighting module opens up a completely new era of lighting: Its flexibility allows you to turn luminaires and light installations organically. Linear and area luminaires, as well as pendant and free standing luminaires, preserve curved shapes. The curves of walls, ceilings or room-dividers are perfectly traced.

The OLED lighting module provides homogeneous and non-glare area light for local lighting. Even when bent, the consistent colour rendering changes only slightly. With a high system efficacy of up to 50 lm/W, the flexible lighting module completes all the advantages: Efficiency, flexibility and quality.
At a glance: Flexible OLED lighting module

- First bendable area light source
- Slim form factor of < 1 mm
- Easy and simple to integrate in your application
- Excellent colour rendering CRI > 80
- Dimmable neutral white light with 4,000 K
- Reproducible, consistent colour rendering MacAdam 4
- High luminous emittance up to 12,000 lm/m²
- Converter perfectly matched to the OLED modules
Close light

We attach great importance to a strong international presence – this allows us to stay sufficiently close to our customers.
The natural light
ecolution – the ecologically solution for our customers

Tridonic pursues an integral sustainability concept and takes its responsibility seriously – with regard to staff members and customers as well as in terms of the environment and society. Within the scope of this integral sustainability concept, our ecolution initiative provides added value in terms of sustainability and energy efficiency which we offer to our customers:

- Tridonic’s technological innovations help our customers save energy and resources
- Maximum quality and safety levels ensure that Tridonic customers are always on the safe side
- Excellent customer service and premium advisory skills ensure perfect system solutions

**Energy savings through technological innovation**

Our innovative energy-efficient products and lighting management solutions help to save resources – for the benefit of both the environment and your business success. We provide you with component solutions that have been sustainably developed and manufactured and form the basis for state-of-the-art lighting systems which help to save a lot of energy and, accordingly, of CO₂ as well. Naturally, without sacrificing perfect convenience and lighting quality.

**Maximum quality and safety**

Tridonic stands for uncompromising quality, impeccable products and flawless processes. For us it is a matter of course that all applicable provisions and regulations are observed. As a response to your questions regarding our products’ environmental data, we have made certified environmental product declarations available.

**Excellent customer service and advisory skills**

Good advice requires professional product know-how and lots of experience. We provide further education to our staff on a regular basis – a must in times of new technologies and ever-shorter development cycles. Supported by numerous tools, we provide you with designs, visualisation, advice and inspiration. This enables us to find the best solutions for your requirements and demands – with regards to both economic and environmental aspects.
Light.
Exploring it, understanding it, and creating new lighting concepts – this is Tridonic’s core expertise. For more than 50 years we have been turning your ideas into light. Today, some 2,000 experts all over the world put in all their creativity to develop cutting-edge technologies to be used for the control and operation of innovative lighting systems; and they are doing it with great passion, in cooperation with you.

**We devote all our energy to your light.**

Further information and ordering data:

- **Product Leaflet**
  - OLEDmodule
  - LUREON REP and LUREON REM

- **Product Leaflet**
  - OLEDmodule
  - LUREON PURE

- **Data sheets available at** www.tridonic.com, “Technical data” menu