Luflex

LG OLED light

Press Kit March 2018, Light + Building

"OLED Light, for your Eyes"

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LUFLEX AT LIGHT+BUILDING 2018 IN FRANKFURT

LG Display Showcased Luflex OLED Lighting Products At Light+Building 2018

LG Display showcased its latest OLED lighting advancements at Light+Building 2018 in Frankfurt, Germany. With the cutting-edge OLED lighting products of Luflex, the newly launched brand for OLED light panels, the company unveiled various innovative OLED lighting products, emphasizing the limitless flexibility and infinite inspiration that they offer, under the theme of "Infinite Light".

LG Display's Luflex OLED light panels, while enabling slim and unique designs with a thin and flexible form factor, provide soft and natural light with less blue light, thus reducing eye fatigue. Luflex is a portmanteau of the Latin word lux, which means light, and the English word flex, which not only refers to flexibility in physical form but also in application.

Most notably, Luflex panels can be twisted and rolled up to a 30mm radius of curvature without compromising any functionality. The panels' thickness of 0.41mm puts them in a league of their own when compared with traditional light sources, and they also offer design potential that is sure to set fire to creative imaginations.

LG Display introduced its Crystal Sound OLED (CSO) Lights by extending the use of its CSO technology used for its TV panels to OLED light panels for the first time in the world. The paper-thin OLED light panel itself serves as a speaker diaphragm with the sound emanating directly from the panel which is vibrated by exciters attached to the back. A flexible, natural lighting installation that also serves as a speaker not only delivers futuristic design and natural illumination, but also premium sound -- hence the name. This new technology is expected to be widely used in AI-integrated mood lamps and ceiling lamps that will be able to talk with you as well as light up your life.

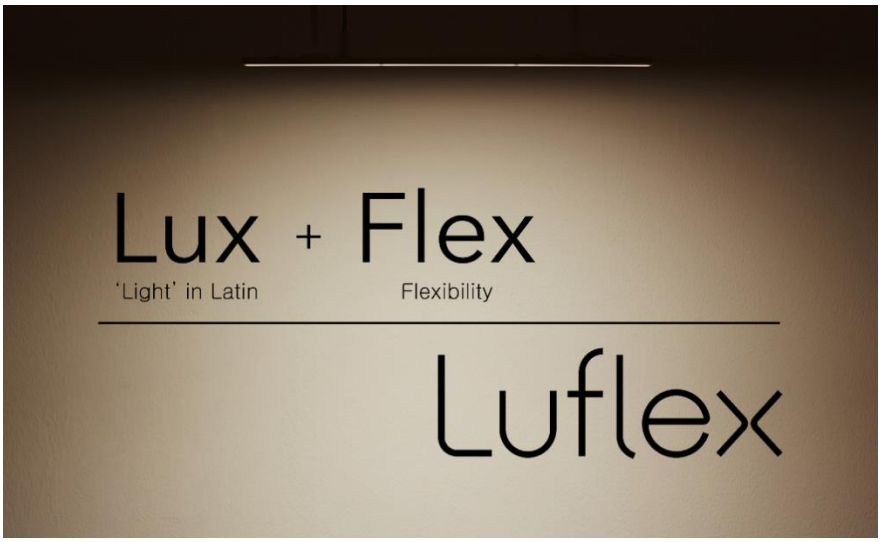
LG Display also showcased in its booth the Transparent Connection Solution, which has now been upgraded to be used with flexible OLED light panels and the winners of a design competition held last year.

Below are pictures of LG Display's Luflex OLED lighting products at Light+Building 2018.

THE NEW BRAND OF LG OLED LIGHT, LUFLEX

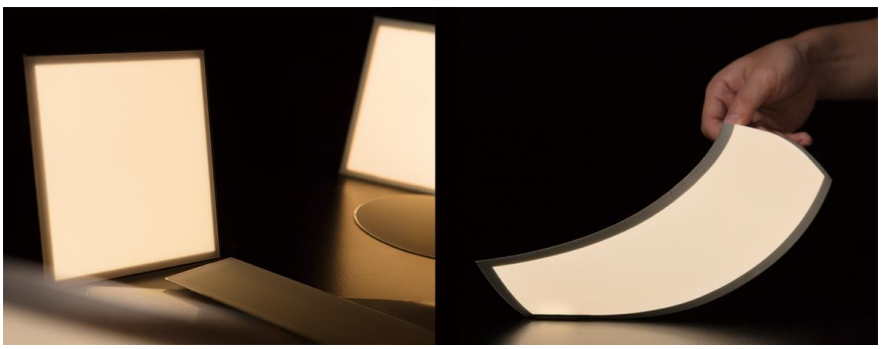
LG OLED Light Launching a New Brand, Luflex

Luflex is the component brand name for LG Display's OLED light panels. The word is a combination of "lu" (short for "lux") and "flex" (short for "flexibility"). The new brand reflects one of the core characteristics of OLED lighting – that it is flexible, bendable and rollable, making it highly design-friendly. Beyond this flexible form factor, OLED lighting also boasts flexibility in a wide range of applications.



Luflex OLED light panels manufactured by LG Display seek to inspire and motivate designers, architects, lighting manufacturers and other professionals who value the quality of light and the human-centric characteristics that OLEDs possess. LG Display and its partners are convinced that Luflex's human-centric characteristics will enhance the quality of life and light, globally.

Luflex aims to embody the benefits of OLEDs and materialize them in the form of luminaires, products, and installations. Also, it will provide massive benefits to customers with the tools in the form of OLED light so that they may realize their dreams of integrating good quality light into unique designs.



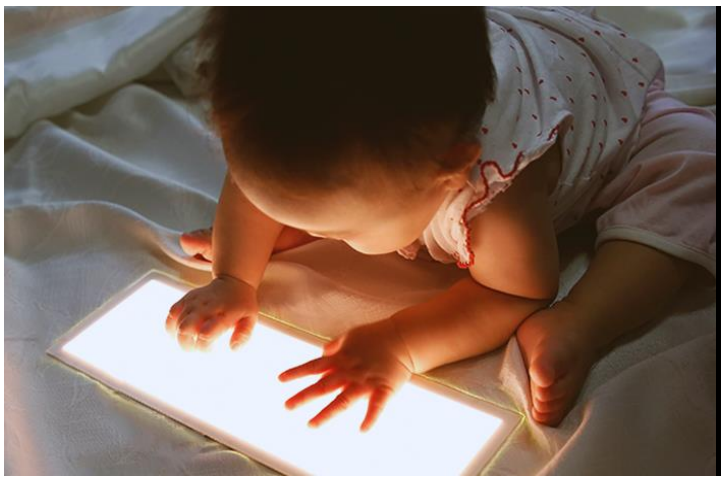
UNIQUE VALUES OF LUFLEX

"OLED Light, for your Eyes"

Luflex, LG OLED light, is OLED light panels produced by LG Display. OLED light, while enabling slim and unique design with its thin and flexible form factor, provides premium-quality light with low blue light emission that could cause eye fatigue.

Eye-Comfort

OLED is a thin, lightweight, and sometimes flexible surface light source. However the significance of this technology goes beyond its unique form factor. OLEDs provide a natural and pleasant light with low glare, no UV, and very little heat emission. Being a uniform surface light source by nature, OLEDs also reduces the hard edged shadows which can be a source of eye fatigue. In fact, several test results also show that actively reading under OLED light may actually cause lesser eye strain than our general surroundings. On top of all this, high level of color fidelity comes as a bonus.



Eye-Comfort

- Less Blue Light
- Less Eye Fatigue
- Soft & Natural Illumination

No Blue Light Risk

OLEDs, do not carry any blue light risk that can cause retinal damage leading to weakening or loss of vision.

Premium Light Quality

OLEDs produce bright illumination that is at the same time soft and evenly diffused. As such, OLEDs create a pleasant atmosphere.

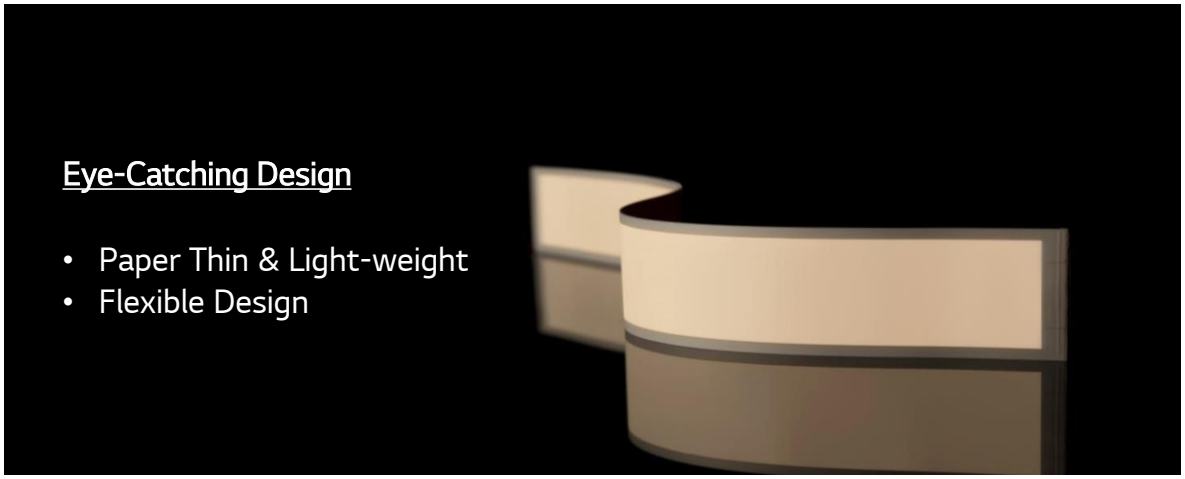
Low Glare, High Uniformity, Low Heat

OLED light is a surface light source with low glare and high uniformity. Exposure to glaring light can damage the eyes, and continuous exposure could result in diminished eyesight. OLED light panels are touchable and easy to handle as they produce very low heat (<35℃) and eliminate the need for heat sinks and diffusers.

UNIQUE VALUES OF LUFLEX

Eye-Catching Design

OLED panels present unprecedented design opportunities thanks to its flexibility, thin form factor and light weight. With regards to the quality of light, OLED already possesses the characteristics that can bring about positive change. Moreover, this statement can be visualized through unique designs that can only be made available through OLEDs. Luflex aims to embody the benefits of OLEDs and bring materialize them in the form of luminaires, products, and installations.



Extremely Thin & Light

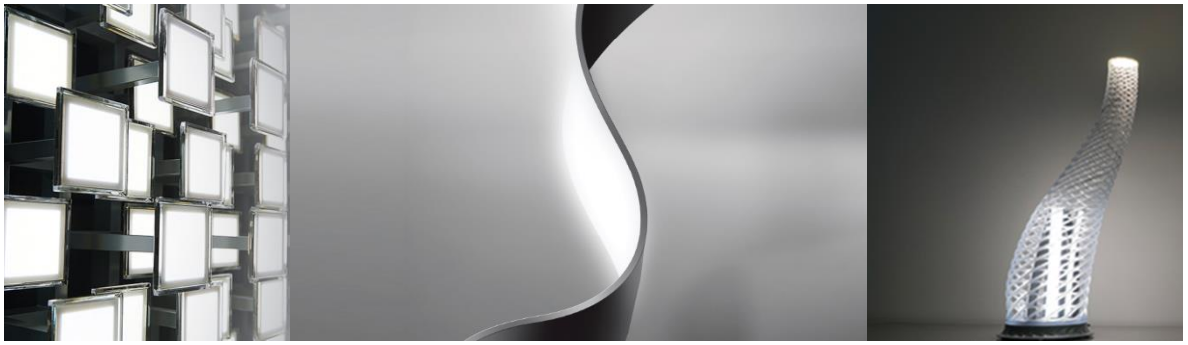
Its slim structure and super-light weight allow for far greater freedom for interior design, shop fitting, and architecture as well as other fields that are open to the future use of OLED.

Truly Flexible

The flexibility of OLEDs revolutionizes existing concepts of light sources. "Truly Flexible" technology further enhances the creativity of lighting designers and architects.

Collaboration with Top-tier Designers

Luflex has collaborated with Ron Arad, Ross Lovegrove, Tokujin Yoshioka and more in spreading OLED's design benefits.



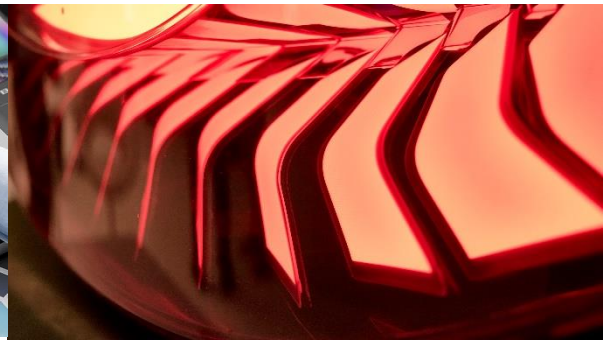
OLED LIGHT FOR AUTOMOBILES

OLED Light in Rear Lamps of Automobiles

OLED light panels bring stylish new possibilities to the automotive sector, one of the most hottest industrial design fields today and LG Display is actively collaborating with multiple leading car makers which are adopting OLED panels for their automobiles.

Luflex panels provide the ultimate design freedom, which means reflectors, light guides or similar optical components are not required. Thanks to their slimness, Luflex panels offer more internal space in cars. Their non-dazzling illumination and unshatterable durability make them ideal for auto application.

Luflex panels are particularly ideal for rear lamps. Car rear lamps demand durability and also make an impact on overall car design. The flexibility of OLEDs enable the rear lamp illumination to kinetically interact with the automobile's action, along with designer's freedom in 3D space of the rear lamps.



OLED Light in Interiors of Automobiles

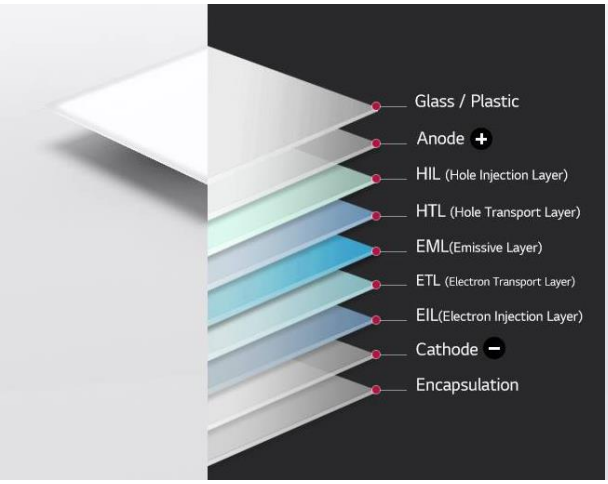
Thanks to the thinness and lightness, OLED light panels are the ideal fit for car interiors. To examine their potential in car interior applications, LG Display has supplied OLED light panels to a Korean auto customizing firm.

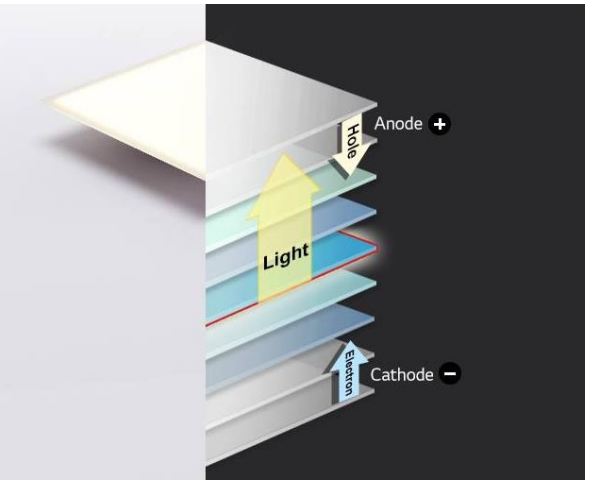
OLED light panels are surface light sources which emit evenly diffused light.
Luflex panels create psychological comfort and a glamorous feel for the driver and passengers.

INTRODUCTION TO OLED LIGHT

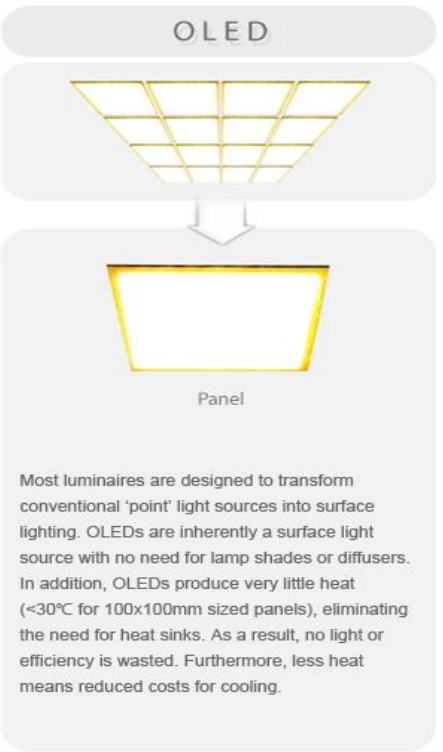
Organic Light-Emitting Diode (OLED) Lighting

OLED (Organic Light Emitting Diode) is the only flat surface light source. It is made up of layers of organic materials. The source of the light is the EML (Emissive Layer) which responds to electric currents by emitting light. Other layers that comprise the organic compound are the ETL (Electron Transport Layer), HTL (Hole Transport Layer), HIL (Hole Injection Layer). Their role is to optimize the flow of the electric current so that the EML's light emission is maximized.





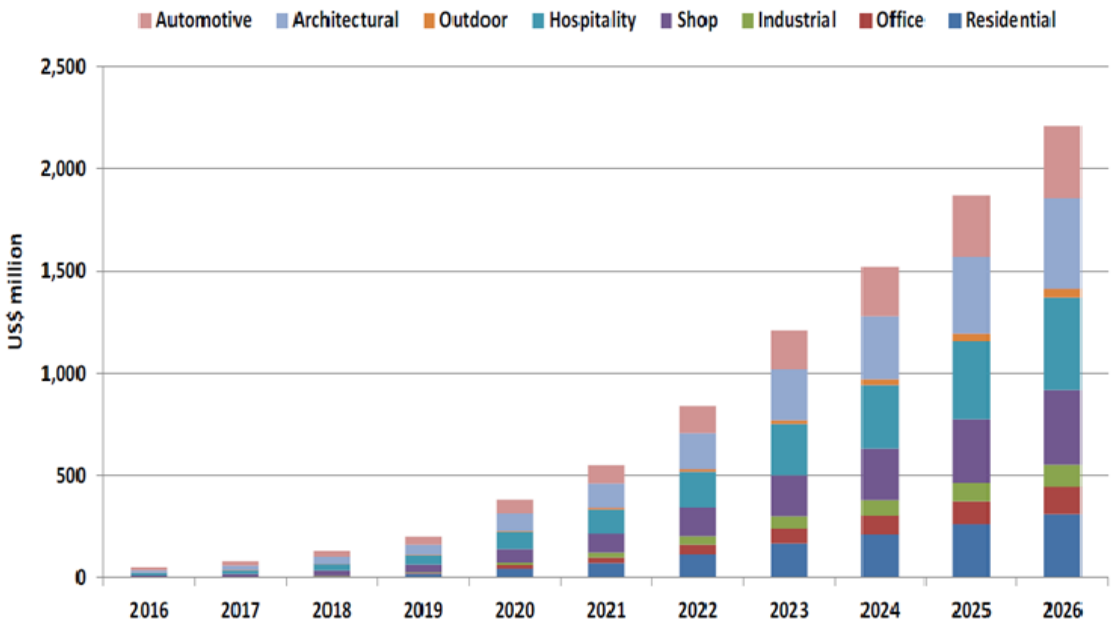
Compare the Limited Space that OLED Takes up Compared to LED



MARKET TRENDS

OLED Lighting Market Trends

According to the research of IDTechEx, a market research firm, the market for OLED lighting panels will rise to US$ 2.2 billion in 2026. The market will grow from a small base, therefore registering a CAGR of 52% over the coming decade.



* Source: IDTech Ex Research

5TH GENERATION OLED PLANT

World's First 5th Generation OLED Light Panel Plant

LG Display started mass production at its new Gen 5 OLED light panel production line in Gumi, Korea from the end of November 2017.

The Gen 5 line initially produces 15,000 sheets of 1,100 x 1,250mm sheets per month, as compared to the previous Gen 2 line, which manufactured 4,000 sheets of 370 x 470mm sheets monthly - about a 30-fold increase. The production capacity will be gradually ramped up.

The new facility grants the company panel size flexibility. With the larger glass substrate, LG Display is now able to produce a wide range of different size light panels, including giant ones. Moreover, the resultant economy of scale will bring down prices, enabling a wider adoption of OLED lighting and kick-starting the nascent market.

LUFLEX HIGHLIGHTS AT LIGHT & BUILDING 2018

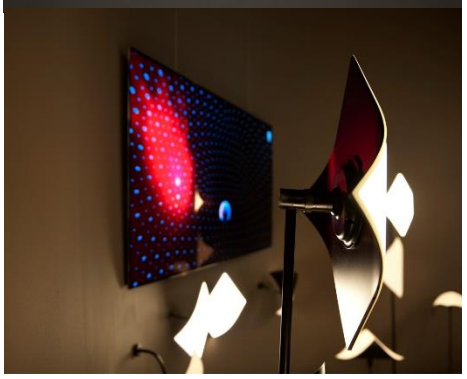
Crystal Sound OLED Technology with Luflex

At Light & Building 2018, Crystal Sound OLED (CSO), the unique technology of LG Display is applied to Luflex panels. Once it is applied to OLED light panels, it not only delivers futuristic design and natural illumination, but also delivers premium sound. The reason behind its naming, Crystal Sound OLED, is in its strength in performing high-pitched sounds.

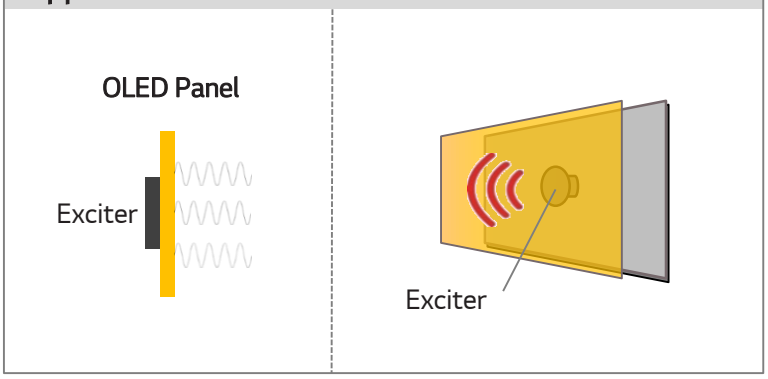
Through Crystal Sound OLED (CSO), the panel is effectively turned into a speaker, with itself serving as the speaker's diaphragm. This is made possible only through the OLED, self-illuminating technology.

The fact the panel functions as the speaker allows for a slim design. It also allows for direct frontal sound delivery. Listeners can feel the sound directly coming at them. With light and sound coming from the same place, the synchronized effect allows for a clear and direct sound and provides more immersive experience.

It obviously breaks the boarder line of the existing categories and shows the transcendental forms in the future. This technology is expected to be widely used in AI integrated mood lamps and ceiling lamps where sound is needed along with lighting.



Application

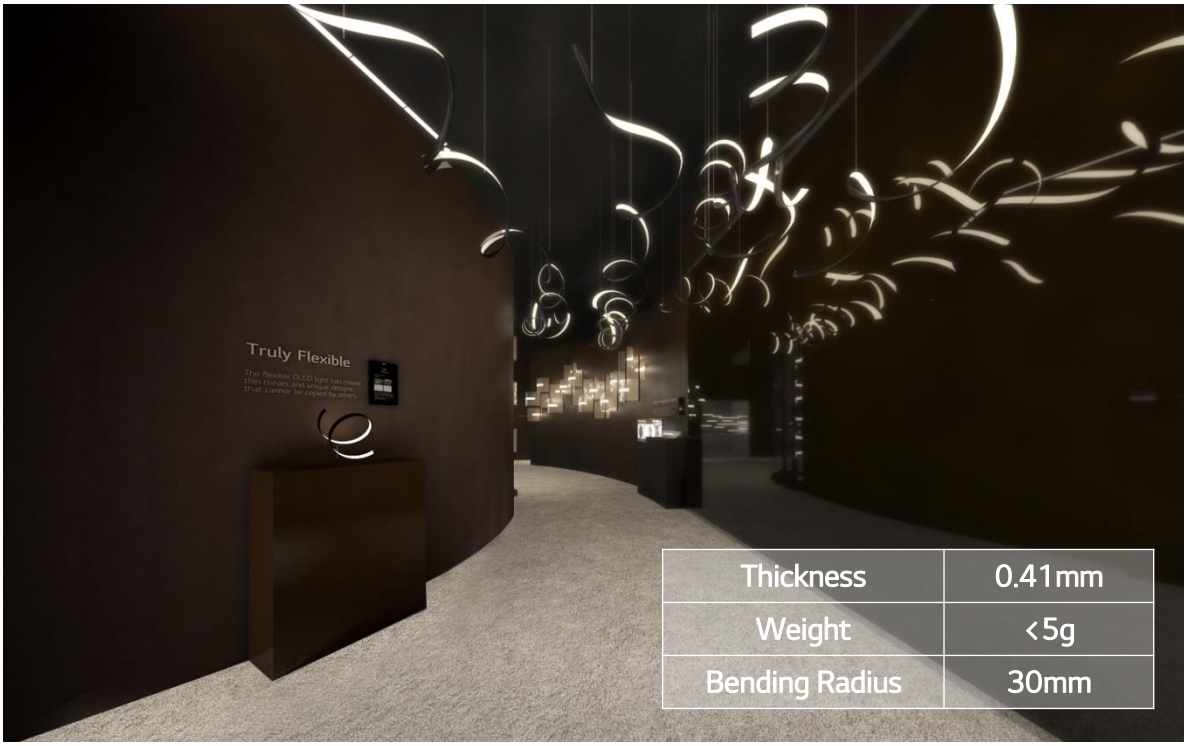


LUFLEX HIGHLIGHTS AT LIGHT & BUILDING 2018

Flexible Panels

Luflex is already known worldwide for its flexible panel technology and the numerous benefits it provides to designers, architects, lighting professionals and customers around the world.

The bending radius of Luflex OLED panels is gradually improved, reaching 30mm and the thickness is 0.41mm. This bendable type panel has expanded the boundaries of lighting and interior design and it has also inspired many designers with creativeness for their masterpieces.



Thickness	0.41mm
Weight	<5g
Bending Radius	30mm

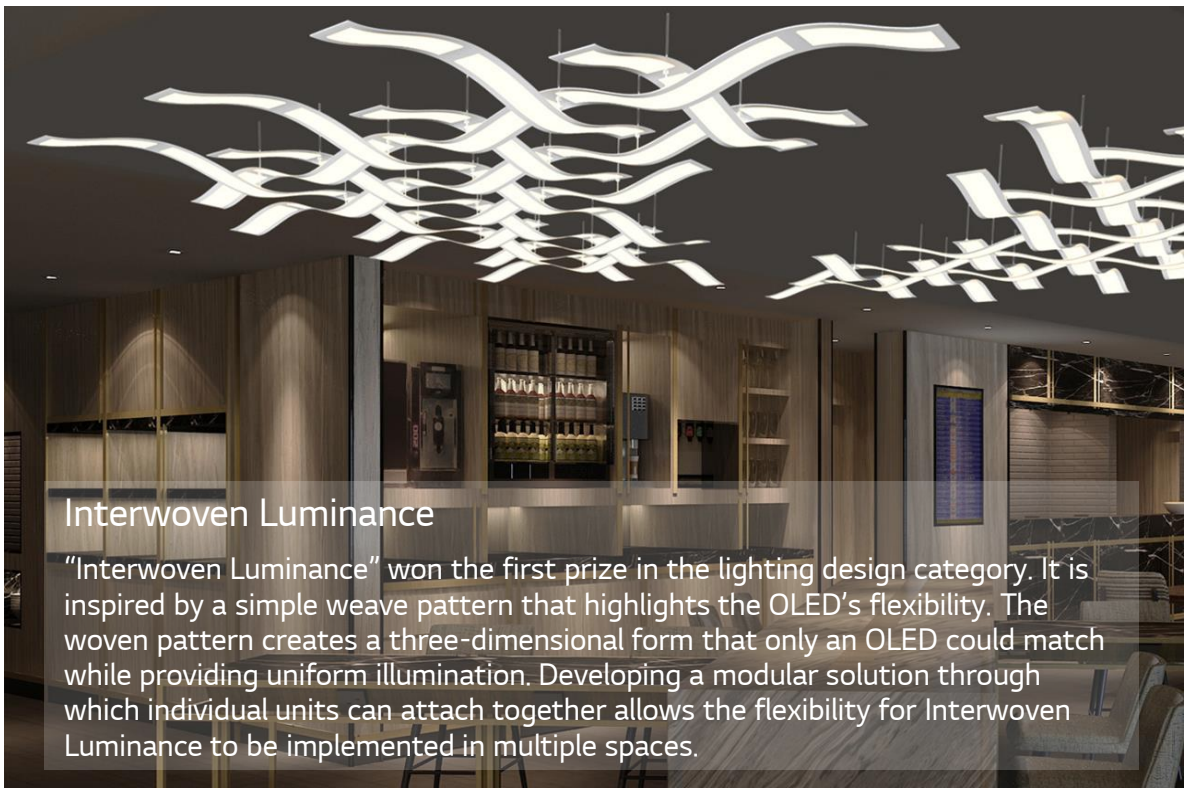
LUFLEX HIGHLIGHTS AT LIGHT & BUILDING 2018

Curved Transparent Connection Solution

Luflex can generate a floating light effect when attached with glass with metal mesh transparent conductive film. At Light and Building 2018, the transparent connection solution is newly formed with flexible panels. This Curved Transparent Connection Solution can offer outstanding values for premium design, which can be used in retail shelving system, furniture and etc.

Artworks of LG OLED Design Competition

From September 11 to November 30, 2017, Luflex held an international design competition called "LG OLED Design Competition 2017" to provide a special opportunity to designers, architects, professionals, and people around the world who are interested in Luflex's technology. More than 650 people around the world submitted their unique and creative designs and 7 renowned designers and art directors participated as juries to select the winners of the competition.

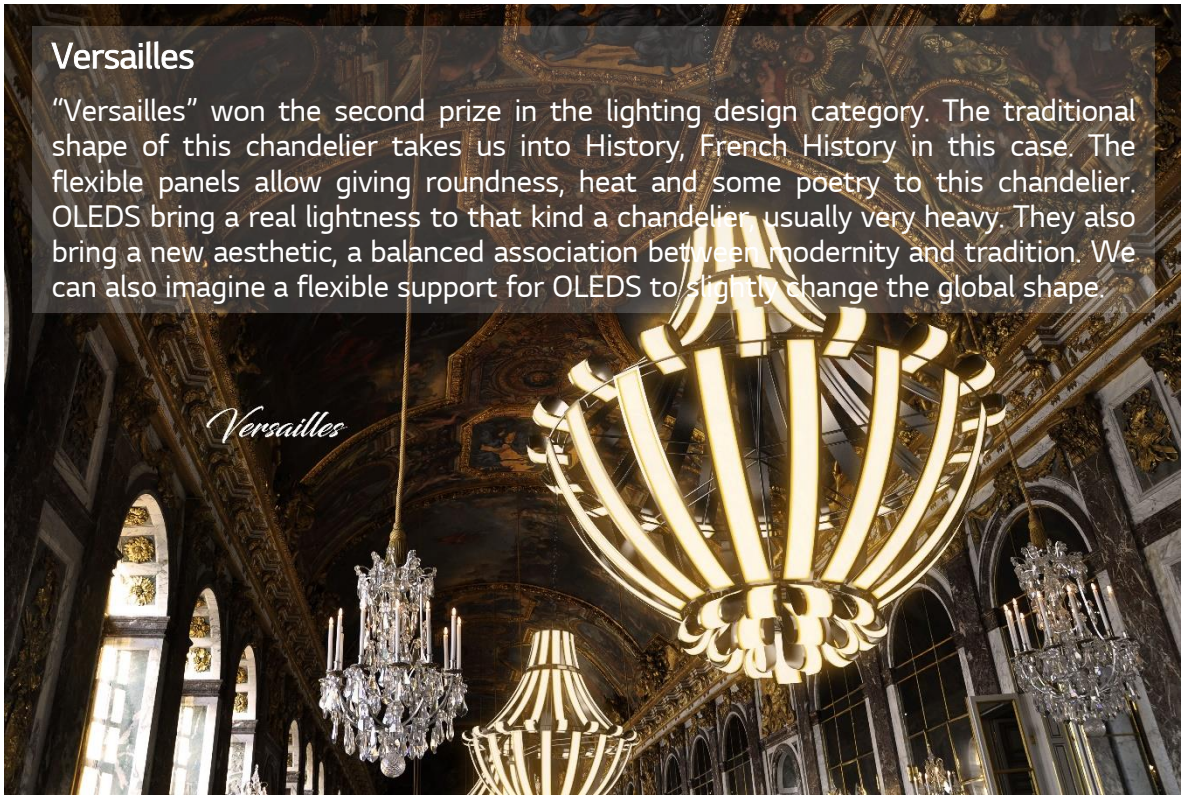


Interwoven Luminance

"Interwoven Luminance" won the first prize in the lighting design category. It is inspired by a simple weave pattern that highlights the OLED's flexibility. The woven pattern creates a three-dimensional form that only an OLED could match while providing uniform illumination. Developing a modular solution through which individual units can attach together allows the flexibility for Interwoven Luminance to be implemented in multiple spaces.

LUFLEX HIGHLIGHTS AT LIGHT & BUILDING 2018

Artworks of LG OLED Design Competition



Versailles

"Versailles" won the second prize in the lighting design category. The traditional shape of this chandelier takes us into History, French History in this case. The flexible panels allow giving roundness, heat and some poetry to this chandelier. OLEDS bring a real lightness to that kind a chandelier, usually very heavy. They also bring a new aesthetic, a balanced association between modernity and tradition. We can also imagine a flexible support for OLEDS to slightly change the global shape.

Tensione evolutiva

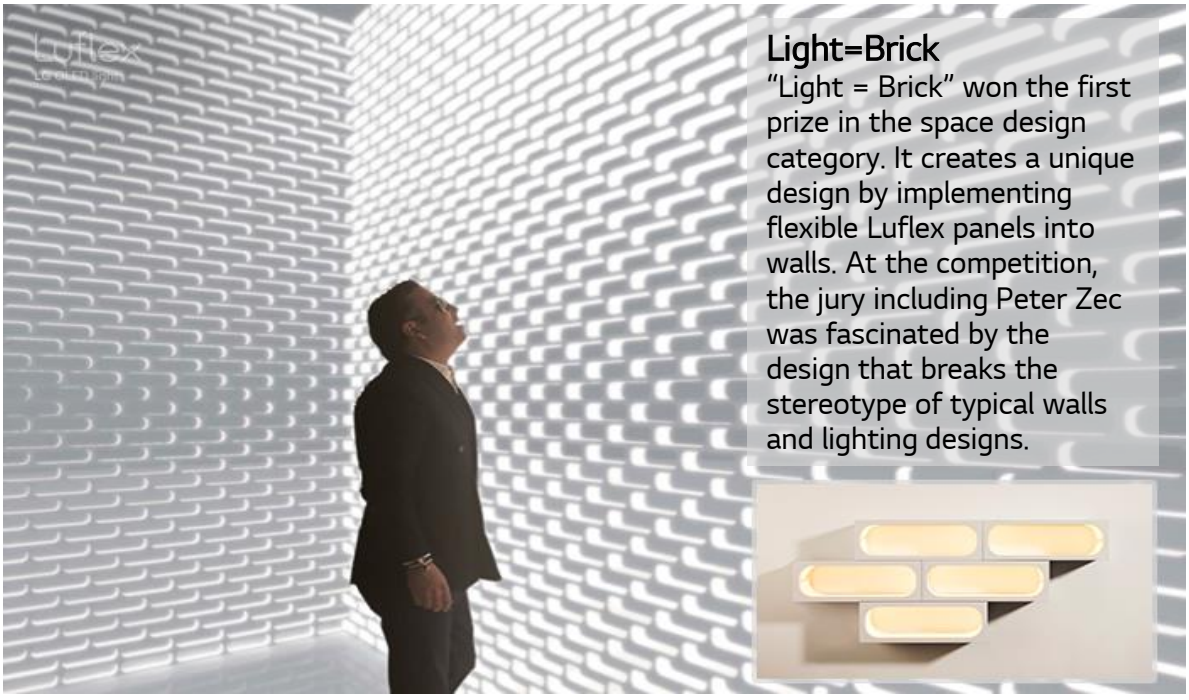
This demonstrates the beauty of flexible Luflex panel and the modular design It successfully shows how Luflex can be created into a small product such as table lamp or a big product such as a wall installation.

LUFLEX HIGHLIGHTS AT LIGHT & BUILDING 2018

Artworks of LG OLED Design Competition

Snapping Light Surface

"Snapping Light Surface" explores the integration between flexible Luflex panels and a unique folding or "snapping" motion. Flexible Luflex panels are attached to the inside surfaces of two bands to create a honeycomb like structure and fabric are attached inside each module.



Light=Brick

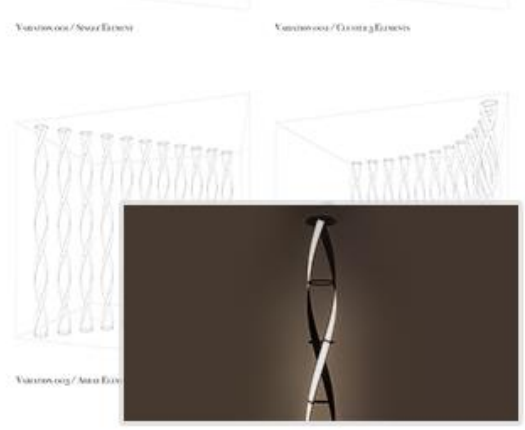
"Light = Brick" won the first prize in the space design category. It creates a unique design by implementing flexible Luflex panels into walls. At the competition, the jury including Peter Zec was fascinated by the design that breaks the stereotype of typical walls and lighting designs.

LUFLEX HIGHLIGHTS AT LIGHT & BUILDING 2018

Artworks of LG OLED Design Competition

Light Column

"The Light Column" is inspired by life itself. The design is influenced by the structure of a DNA molecule – double helix. As a space defining element and with its features (being a source of light), it is a clear manifestation of the OLED technology.



Luflex for Daimler Benz S-class Coupe

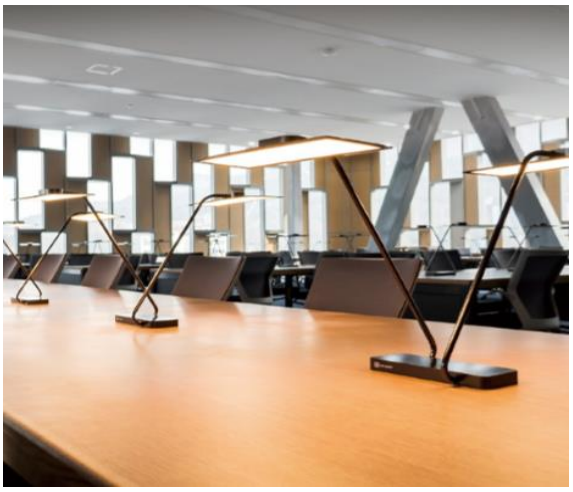
At Frankfurt Moto Show in September 2017, Daimler Benz, the representative car manufacturer produced a teaser video highlighting the use of OLEDs for the taillights of its upcoming S-Class Coupe. It showcased the new taillights made up of 33 individually controlled OLED panels, which attracted much interest from global media with its promising sophisticated effects.

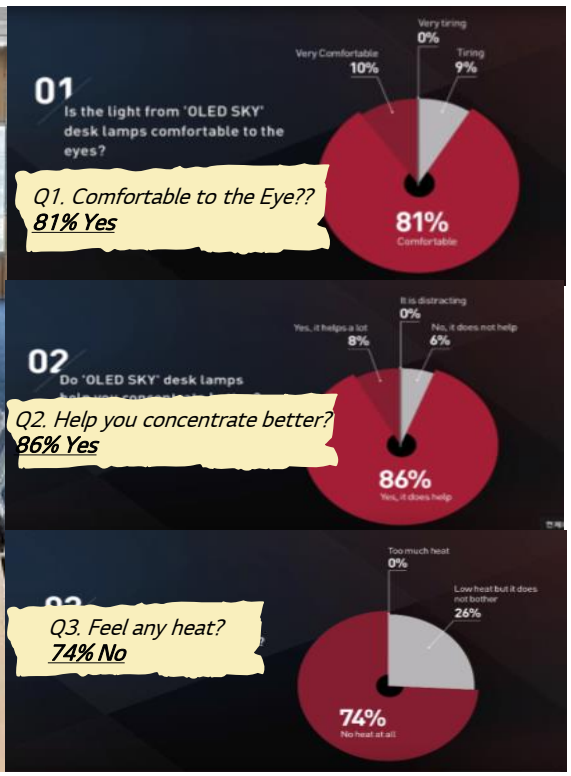
The ultimate slimness and flexibility are all the range in the taillights of the future automobiles. Luflex is showing the paradigm shift in auto market and the car makers are moving for the future.

LUFLEX INSTALLATION REFERENCES : EYE-COMFORT

Seoul National University Library

Seoul National University adopted Luflex for its library reading lights with 1,100 panels. Luflex was chosen because it is the most appropriate lighting for students as it provides a natural light that is comfortable to the eyes. The survey conducted with students who have studied in the library has shown that the students could focus better, felt less discomfort from lengthy studying time under the light and did not feel any discomfort from heat that the fixture may generate if they were to be manufactured with any other conventional light sources.





LUFLEX INSTALLATION REFERENCES : EYE-COMFORT

OLED Mirror at Walkerhill Hotel, Seoul

Walkerhill Hotel in Seoul has adopted Mirror Solution with Luflex for their restroom in the ballroom. The uniformly diffused light generates less shadow with less glare which helps to make the user experience more pleasant. The uniformity of the Luflex and extraordinary light quality upgraded the premium and luxurious mood of this very high-end hotel. The Mirror Solution is expected to be further installed in high-end hotels all around the world.

Eye-Comfort

- Less Blue Light
- Less Eye Fatigue
- Soft & Natural Illumination

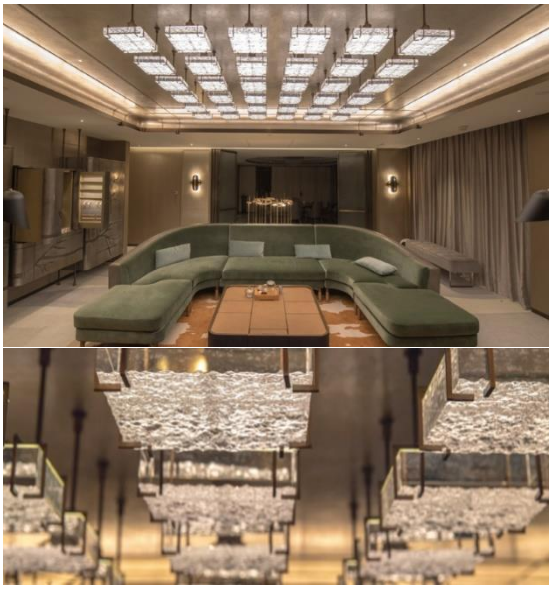
Dressing Room (Private Residential)

Luflex are thin and light which enable the interior designers to integrate them into more intricate, smaller areas. Also, since the they emit very low heat, the panels can be applied to any materials including wooden shelves without the need of heat sinks. The high CRI which the OLEDs bring to the dressing room highlights other application possibilities, such as fitting rooms in retail stores.

LUFLEX INSTALLATION REFERENCES : EYE-CATCHING DESIGN

Landmark Mandarin Oriental in Hong Kong

Landmark Mandarin Oriental is one of the best hotels in Hong Kong located in the heart of downtown of Hong Kong financial district. This premium brand hotel has renovated its rooms, including its private suite located in the top floor, in 2017. While designing a uniquely designed chandelier for the suite, TELCS Lighting Design and Consultancy has decided to use Luflex in their design for its premium light quality and its beautiful dimming features. The chandelier reflected its own surface on the top of the chandelier which was only obtainable through using OLED light panels.



Baskin Robbins Brown in Seoul

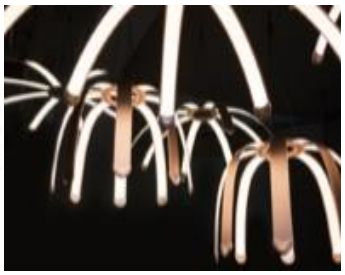
On September 1st, 2017, SPC Group, Korea's largest food company opened 'Baskin Robbins Brown' in Seoul Korea. 'Brown' is a premium rendition of the Baskin Robbins franchise, offering a variety of food and beverages. Most notable is their specialty ice-cream that comes in one hundred flavors. In order to instill the sense of 'premium' into their new brand launch, SPC Group paid attention to every detail, specifically in lighting. OLEDs were perfect in obtaining unique aesthetics with its outstanding flexibility. With natural illumination from Luflex, customers are awed by this premium installation done with OLEDs and SPC Group is looking into further expanding the branches also lit with premium light quality of Luflex.

DESIGNER COLLABORATION

Ron Arad

Renowned for his experimentation with materials, architect and designer Ron Arad explored the possibilities of light, using Luflex. In support of a must-see exhibition at 100% Design, Ron Arad had a talk-show discussing the role of light in design, and how this new technology might change basic principles of design and architecture, alongside with Ron's latest projects around the world. Using Luflex, which is as thin as paper, Ron has represented letters, phrases, thoughts, expressions and pictures on large plates of steel in his artwork called the "Envelope." In the exhibition, through a soft and warm glow unique to OLED, each letter and picture was able to radiate and make an incredible, indelible impression. The concept revitalized new perspective in light, and allowed the visitors to explore the awe of light in a whole new dimension.

Ross Lovegrove

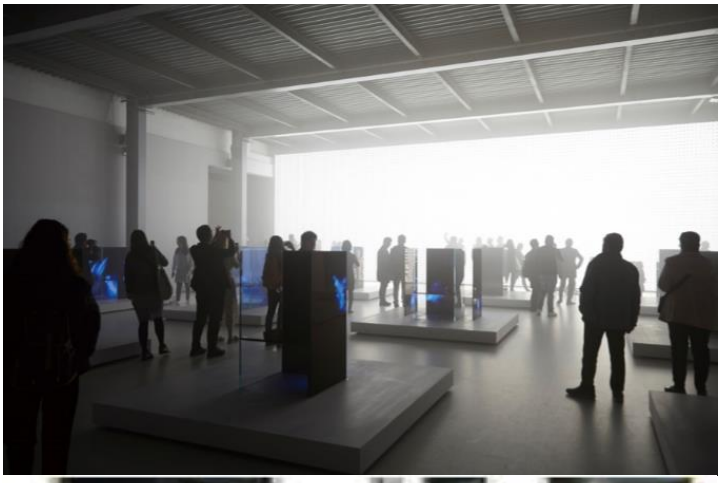


Ross Lovegrove, also known as "Captain Organic" for his organic designs, has collaborated with Luflex in creating two very exceptional light fixtures, "Medusa" and "Pyrosome." Both inspired by sea creatures, Ross has uniquely explored the world of OLEDs in his own organic ways. Especially, "Medusa" has gained the most attention from the visitors at the booth, resulting in winning the MIAW design award in the lighting segment. Under the theme "The Light of Inspiration", the event came to a close with great success, resulting in more than 10,000 visitors attending the booth.

REFERENCES – DESIGNER COLLABORATION

Tokujin Yoshioka

Tokujin Yoshioka and LG has collaborated in creating the state-of-the-art OLED lighting and display installation during the Milan Design Week called "S.F_Senses of the Future" which has won the first prize at the Milan Design Week. Total of 30,000 Luflex were used in the project to generate the "Wall of the Sun" which many visitors were awed by. It simulates sunlight by exuding appealing warmth to visualise how human-oriented lighting could be envisioned in the future. "S.F_Senses of the Future" has won the Grand Prix at Reddot Design Award 2017.



SOCIAL MEDIA CHANNELS

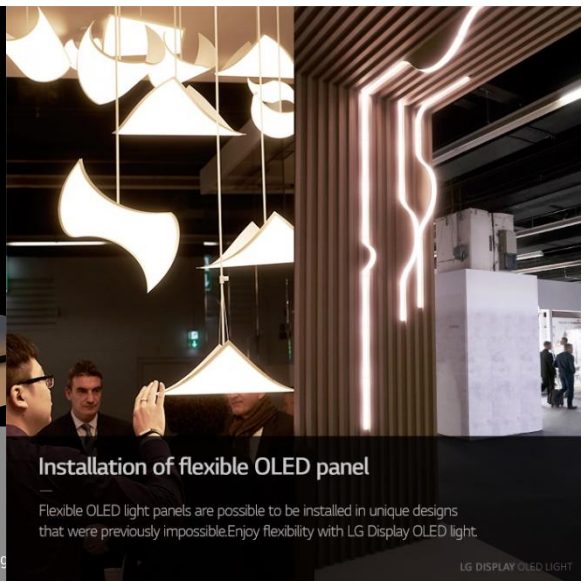
LG Display is represented on such social media channels as Facebook, YouTube and Google+. On these channels, you can find the latest news about LG Display OLEDs, unique application ideas and installation references for OLED lights. Videos of reference projects are posted in order to capture the eyes of potential customers.

Website : www.lgoledlight.com

Facebook : www.facebook.com/lgoledlight

Youtube : www.youtube.com/lgoledlight

Linkedin : www.linkedin.com/company/lgoledlight



Luflex

LG OLED light

"OLED Light, For Your Eyes"

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