

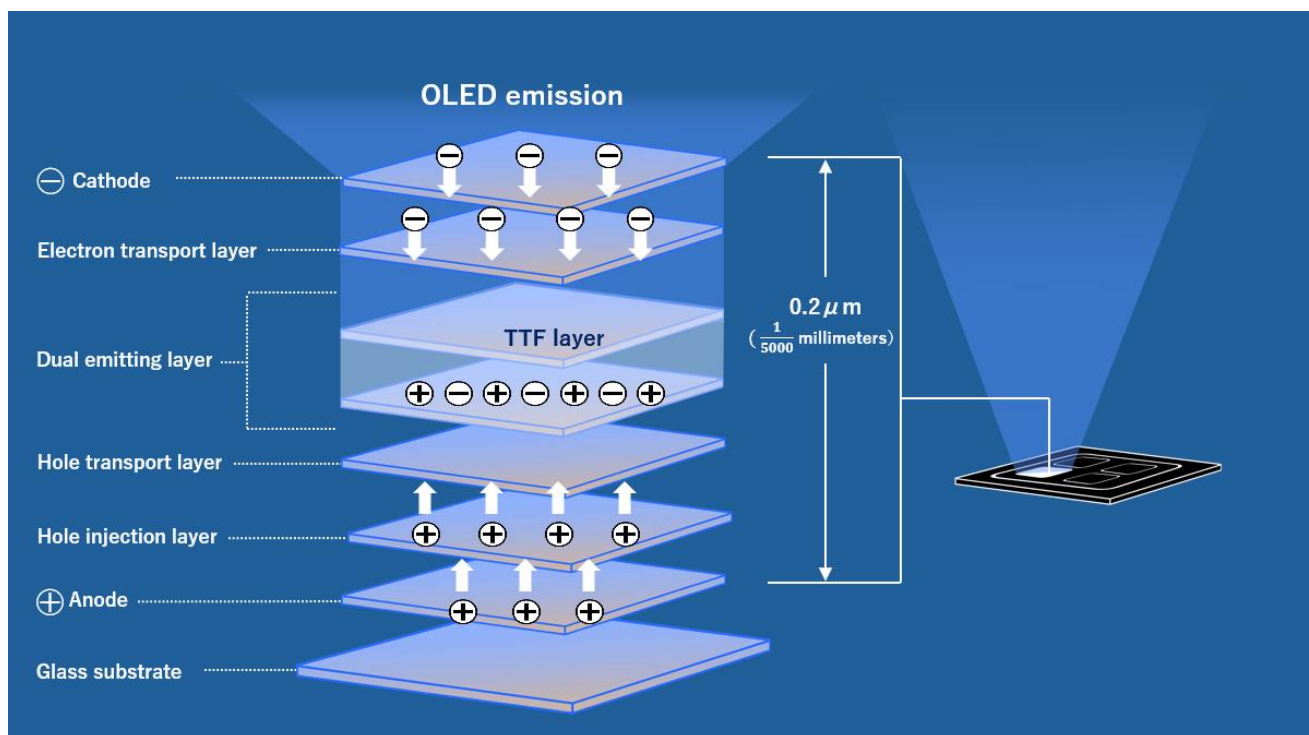
May 19, 2025
Idemitsu Kosan Co.,Ltd.

Achievement of the World's Highest Level of Blue OLED Performance with Dual emitting layer Devices

- Winner of the Distinguished Paper Award for the second time at
"Display Week" -

Idemitsu Kosan Co.,Ltd. (Headquarters: Chiyoda-ku, Tokyo; Representative Director, President: Noriaki Sakai, hereinafter referred to as "Idemitsu") has conducted a detailed analysis of stacked light-emitting layer devices in the field of organic electroluminescent devices using fluorescent blue materials and achieved the world's highest level of luminous efficiency and service life extension. This technology contributes to the reduction of environmental impact by reducing power consumption of OLED displays and extending product service life.

These results won the Distinguished Paper Award^{*1} in the OLED Technology category at "Display Week 2025," a symposium hosted by the Society for Information Display, the world's largest display-related academic society (May 13-16, 2025, San Jose, USA). This is the second time since 2022 that our stacked light-emitting device technology has won the Distinguished Paper Award at "Display Week."



Stacked light-emitting layer device mechanism

Dual emitting layer system is a device that separates the areas where charge recombination zone and TTF^{*3} zone in the emission layers of a fluorescent device^{*2}. By separating functions, triplet polaron quenching is reduced, enabling both higher efficiency and longer lifetime.

Idemitsu has been researching OLED materials for about 40 years. In 2022, we succeeded in achieving the world's highest level of luminous efficiency and service life extension in the field of blue OLEDs and were selected for the distinguished paper award at "Display Week 2022." Subsequent development has continued to improve efficiency and lifetime, resulting in a 20% reduction in power consumption compared to a single light-emitting layer.

In addition, this technology is highly effective and is being adopted in products. In April 2025, Idemitsu also received the "18th Achievement Award" from the Japan OLED Forum^{*4} in recognition of its contributions to the industry.

■Summary of results

In the red, green, and blue pixels that make up an OLED display, only the blue pixel use fluorescent emission which poses challenges for efficiency and lifetime.

We focused on the unique functionally separated of dual emitting layers and reported a detailed analysis of the mechanism. By optimizing the material design for each layer, we have achieved further improvement in efficiency and lifetime in top-emission devices^{*5} that are currently in practical use.

■Performance overview

Method: Blue fluorescent OLED device using stacked light-emitting layers

LT95^{*6}: More than 200 hours (result of drive conditions with current density of 50 mA/cm²)

Efficiency: 350 (Cd/A/CIE-y) (results of drive conditions with current density of 10 mA/cm²)

Chromaticity: (0.14, 0.042) (CIE1931 Chromaticity Coordinates)



Scene from the "Display Week 2025" award ceremony

Through the development of high-performance OLED materials, Idemitsu will continue to contribute to the further enhancement of the performance of OLED devices and displays.

- *1 Highly Efficient and Stable Blue Fluorescent OLED using Dual EML system
Satomi Tasaki, Masato Nakamura, Yu Kudo, Keitaro Yamada, Kazuki Terada,
Tsukasa Sawato, Tomonori Nakamura, Kazuki Nishimura and Emiko Kambe
<https://sid.onlinelibrary.wiley.com/doi/10.1002/jsid.2073>
- *2 Fluorescent device: One of the OLED device methods. The organic material in the device is converted to a high-energy state (exciton) by electricity, and the singlet exciton is used for luminescence.
- *3 TTF: Acronym for Triplet-Triplet Fusion The process by which singlet excitons are produced by collisions between triplet excitons. Efficiency is improved by using triplet excitons, which are not utilized in fluorescent-type devices, for luminescence.
- *4 Japan OLED Forum: <https://yuki-tohronkai.jp/>
- *5 Top emission device: A type of device structure for OLED panels in which light is extracted from the top (cathode side) of the TFT substrate under the organic layer that converts electricity into light.
- *4 LT95: Continuous lighting time until initial brightness decreases by 5%.

[Reference]

Press Release: [New light-emitting method achieves world-class blue OLED performance - Selected as best paper at Display Week 2022](#) - (May 16, 2022)

- Contact for Inquiries on this subject -

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