

Presse Press

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Quantum Dots from Osram make LEDs even more efficient

New conversion technology delivers outstanding efficacy, even at high color rendering indexes with the Osconiq S 3030 Quantum Dot

Quantum Dots (QD) are nanometer-sized semiconductor particles, which means they are about 10,000 times smaller than the diameter of a human hair. Due to their very small size, the light that is re-emitted when blue LED light hits the nanoparticles depends on the size of the particles. For example, QD particles that are roughly three nanometers in size produce green light, while particles around seven nanometers emit red light. This innovative, tunable light conversion technology is now being used for the first time in the Osconiq S 3030 QD mid-power LED from Osram Opto Semiconductors. It marks the first step towards new LED components for the general lighting market. Osram's new mid-power LED Osconiq S 3030 QD was specially developed for area lighting and downlight applications and will empower customers to realize luminaires with high efficacy and excellent color rendering.

When manufacturing conventional white LEDs, the main objectives are efficacy and product quality. Considering both at the same time poses a particular challenge, especially with very high color rendering indexes (CRI), where developers with conventional converter technology have at times, reached their limits. QDs can solve this problem. The great advantage of using these nanoparticles is that the existing LED manufacturing processes remain the same. QDs are simply used instead of conventional phosphors when the converter material is applied.

More than a year ago Osram acquired Pacific Light Technologies (PLT), a leading company in the development and manufacturing of high-performance optical nanomaterials. The PLT QD technology enables Osram to begin to close the efficacy gap that exists between CRI 80 and CRI 90 LEDs today. The new Osconiq S 3030

includes a specially developed QD phosphor solution that enables CRI 90 to achieve an outstanding efficacy value of 173 lm/W at 3000 K – a best-in-class value for 0.2 W high-performance LEDs. The compact dimensions of 3.0 mm x 3.0 mm and the low thermal resistance enable simple system design. The Osconiq S 3030 QD is also available in various color temperatures from 2,700 to 6,500 K.

Another unique feature of the PLT QD technology is that the Quantum Dots are encapsulated to protect them from moisture and other external influences that pose the greatest risk to the functionality of a LED. The special encapsulation technology allows the QDs to reliably master the demanding conditions of on-chip operation within the LED component.

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The Osconiq S 3030 QD is Osram's first Quantum Dot-based LED.
Picture: Osram



Used in commercial lighting fixtures, the Osconiq S 3030 QD delivers outstanding efficacy - even with high CRIs.

Picture: Osram

ABOUT OSRAM

OSRAM, based in Munich, is a leading global high-tech company with a history dating back more than 110 years. Primarily focused on semiconductor-based technologies, our products are used in highly diverse applications ranging from virtual reality to autonomous driving and from smartphones to networked, intelligent lighting solutions in buildings and cities. OSRAM utilizes the infinite possibilities of light to improve the quality of life for individuals and communities. OSRAM's innovations will enable people all over the world not only to see better, but also to communicate, travel, work, and live better. As of the end of fiscal year 2018 (September 30), OSRAM had approximately 26,200 employees worldwide. It generated revenue of more than €3.8 billion from continued operations in fiscal year 2018. The company is listed on the stock exchanges in Frankfurt and Munich (ISIN: DE000LED4000; WKN: LED400; trading symbol: OSR). Additional information can be found at www.osram.com.