

Micro-LEDs achieve superior brightness with Picosun's ALD technology

ESPOO, Finland, 23rd April 2019 – Picosun Group, supplier of the leading AGILE ALD™ (Atomic Layer Deposition) thin film coating solutions, reports superb results in boosting micro-LED performance using ALD passivation.

Micro-LEDs are a strong challenger to existing display technologies such as LCDs (liquid crystal displays), OLEDs (organic light-emitting diodes) or conventional LEDs (light-emitting diodes). Offering compact size, low power consumption, superior brightness and energy efficiency, greater contrast and color saturation, ultra-high resolution, flexibility and good reliability, micro-LEDs are currently actively studied and developed at the leading electronics manufacturers and R&D institutes around the world. Micro-LEDs are typically used for small screens such as those used in tablets, smartphones and smart watches, and the first large area displays have also been demonstrated already.

Still, the micro-LED technology has certain drawbacks that hinder its full-scale commercial breakthrough. The micro-LED screen consists of minuscule pixels producing green, blue and red light. Some steps in the manufacturing process of these pixels easily cause damage to their delicate nanometer-scale structures, which leads to loss of light intensity. ALD has now been proven to effectively fix these damages, not only restoring the light intensity but actually boosting it to superior levels. At Picosun customer site, National Chiao Tung University (NCTU), Taiwan, light-emitting intensity of micro-LEDs has been enhanced by 143.7% by using ALD passivation layers deposited with PICOSUN™ ALD equipment⁽¹⁾.

“We are happy to report these great results achieved in micro-LED efficiency enhancement using ALD technology. PICOSUN™ ALD equipment have been an integral part of our facilities for a long time, and we are always impressed by their performance and the superior ALD film quality obtained with them. Picosun's customer support is also impeccable, which is very much appreciated considering we collaborate extensively with industries. Whenever we need something regarding the equipment or process consultancy, Picosun staff is always up to date and ready to provide thorough answers,” states Professor Hao-Chung Kuo from NCTU.

“NCTU is our prestigious customer and key partner for years already. We are glad that our ALD solutions have enabled this impressive performance boost to their micro-LEDs. Micro-LED technology has immense potential to disrupt the solid state lighting market and our Asian customers, both in industries and R&D, will surely lead the forefront of this development,” continues Mr. Edwin Wu, CEO of Picosun Asia Pte. Ltd.

Picosun provides the most advanced ALD thin film coating technology to enable the industrial leap into the future, with turn-key production solutions and unmatched expertise in the field. Today, PICOSUN™ ALD equipment are in daily manufacturing use in numerous major industries around the world. Picosun is based in Finland, with subsidiaries in Germany, North America, Singapore, Taiwan, China, and Japan, and a world-wide sales and support network. Visit www.picosun.com.

⁽¹⁾ Chen *et al.*, Photonics Research, Vol. 7 No. 4, p. 416 (2019).

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