

Smartkem Demonstrates New MicroLED Package for LCD Backlights

By Guillaume Chansin

Smartkem demonstrated a MicroLED Smart Backlight for LCD panels at Touch Taiwan 2025. The backlight uses the new MiP4, a package of four MicroLEDs connected using Smartkem's chip-first architecture and its unique interlayer dielectric semiconductor materials. The backlight unit measures 12.3", in an aspect ratio often found in automotive displays. The backlight includes a total of 532 MiP4 packages, which means over 2,000 MicroLEDs.

Smartkem has developed a low-temperature OTFT process that allows the use of a low-cost flexible plastic substrate rather than glass or polyimide. In the case of an emissive MicroLED display, it becomes possible to process the backplane after the chips have been mass transferred. Smartkem calls this a "chip-first" approach.

In September 2024, Smartkem announced a joint development agreement with Shanghai Chip Foundation Semiconductor Technology ("Chip Foundation") to co-develop a new generation of MicroLED-based backlight technology for LCD. Smartkem supplied its proprietary organic dielectric single-layer material, or Redistribution Layer (RDL). As part of the co-development project, Smartkem agreed to develop an insulator material that can be used by Chip Foundation to combine its own proprietary MicroLED devices into a high-performance package containing four MicroLEDs wired in series.

The MiP4 is designed to replace existing MiniLED packages in LCD backlights and signage applications. According to the company, the MiP4 will offer higher brightness at lower power, lower production costs, and compatibility with existing MiniLED die-bonding equipment. MiP4s are expected to ship in blue tape format for seamless industry adoption.

Smartkem Chairman and CEO Ian Jenks said, "We are thrilled to be demonstrating the first application of our MiP4 here at Touch Taiwan. This MicroLED backlight demonstrates the capability of our unique semiconductor materials to revolutionize existing display markets, including LCD displays used in the automotive industry. This market holds a huge opportunity for Smartkem as it is forecast to reach more than 25 million units by 2030, each of which would use more than 500 MiP4s."



Source: Smartkem