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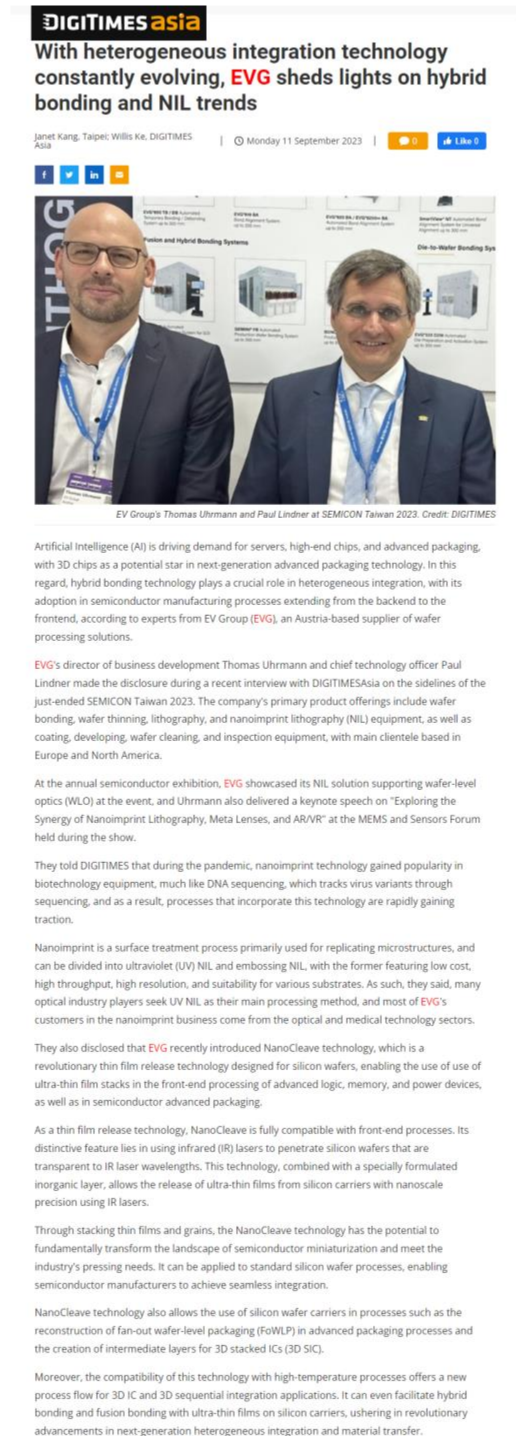
With heterogeneous integration technology constantly evolving, EVG sheds lights on hybrid bonding and NIL trends – September 11, 2023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With heterogeneous integration technology constantly evolving, EVG sheds lights on hybrid bonding and NIL trends

Janet Kang, Taipei; Willis Ke, DIGITIMES Asia | Monday 11 September 2023 | 0 | Like 0

EV Group's Thomas Uhrmann and Paul Lindner at SEMICON Taiwan 2023. Credit: DIGITIMES

Artificial Intelligence (AI) is driving demand for servers, high-end chips, and advanced packaging, with 3D chips as a potential star in next-generation advanced packaging technology. In this regard, hybrid bonding technology plays a crucial role in heterogeneous integration, with its adoption in semiconductor manufacturing processes extending from the backend to the frontend, according to experts from EV Group (EVG), an Austria-based supplier of wafer processing solutions.

EVG's director of business development Thomas Uhrmann and chief technology officer Paul Lindner made the disclosure during a recent interview with DIGITIMESAsia on the sidelines of the just-ended SEMICON Taiwan 2023. The company's primary product offerings include wafer bonding, wafer thinning, lithography, and nanoimprint lithography (NIL) equipment, as well as coating, developing, wafer cleaning, and inspection equipment, with main clientele based in Europe and North America.

At the annual semiconductor exhibition, EVG showcased its NIL solution supporting wafer-level optics (WLO) at the event, and Uhrmann also delivered a keynote speech on "Exploring the Synergy of Nanoimprint Lithography, Meta Lenses, and AR/VR" at the MEMS and Sensors Forum held during the show.

They told DIGITIMES that during the pandemic, nanoimprint technology gained popularity in biotechnology equipment, much like DNA sequencing, which tracks virus variants through sequencing, and as a result, processes that incorporate this technology are rapidly gaining traction.

Nanoimprint is a surface treatment process primarily used for replicating microstructures, and can be divided into ultraviolet (UV) NIL and embossing NIL, with the former featuring low cost, high throughput, high resolution, and suitability for various substrates. As such, they said, many optical industry players seek UV NIL as their main processing method, and most of EVG's customers in the nanoimprint business come from the optical and medical technology sectors.

They also disclosed that EVG recently introduced NanoCleave technology, which is a revolutionary thin film release technology designed for silicon wafers, enabling the use of use of ultra-thin film stacks in the front-end processing of advanced logic, memory, and power devices, as well as in semiconductor advanced packaging.

As a thin film release technology, NanoCleave is fully compatible with front-end processes. Its distinctive feature lies in using infrared (IR) lasers to penetrate silicon wafers that are transparent to IR laser wavelengths. This technology, combined with a specially formulated inorganic layer, allows the release of ultra-thin films from silicon carriers with nanoscale precision using IR lasers.

Through stacking thin films and grains, the NanoCleave technology has the potential to fundamentally transform the landscape of semiconductor miniaturization and meet the industry's pressing needs. It can be applied to standard silicon wafer processes, enabling semiconductor manufacturers to achieve seamless integration.

NanoCleave technology also allows the use of silicon wafer carriers in processes such as the reconstruction of fan-out wafer-level packaging (FoWLP) in advanced packaging processes and the creation of intermediate layers for 3D stacked ICs (3D SIC).

Moreover, the compatibility of this technology with high-temperature processes offers a new process flow for 3D IC and 3D sequential integration applications. It can even facilitate hybrid bonding and fusion bonding with ultra-thin films on silicon carriers, ushering in revolutionary advancements in next-generation heterogeneous integration and material transfer.

https://www.digitimes.com/news/a20230911PD201/evg-semicon-taiwan-2023-technology-wafer-level-packaging.html?mod=3&q=EVG