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EV Group Brings Revolutionary Layer Transfer Technology to HVM – December 7, 2023

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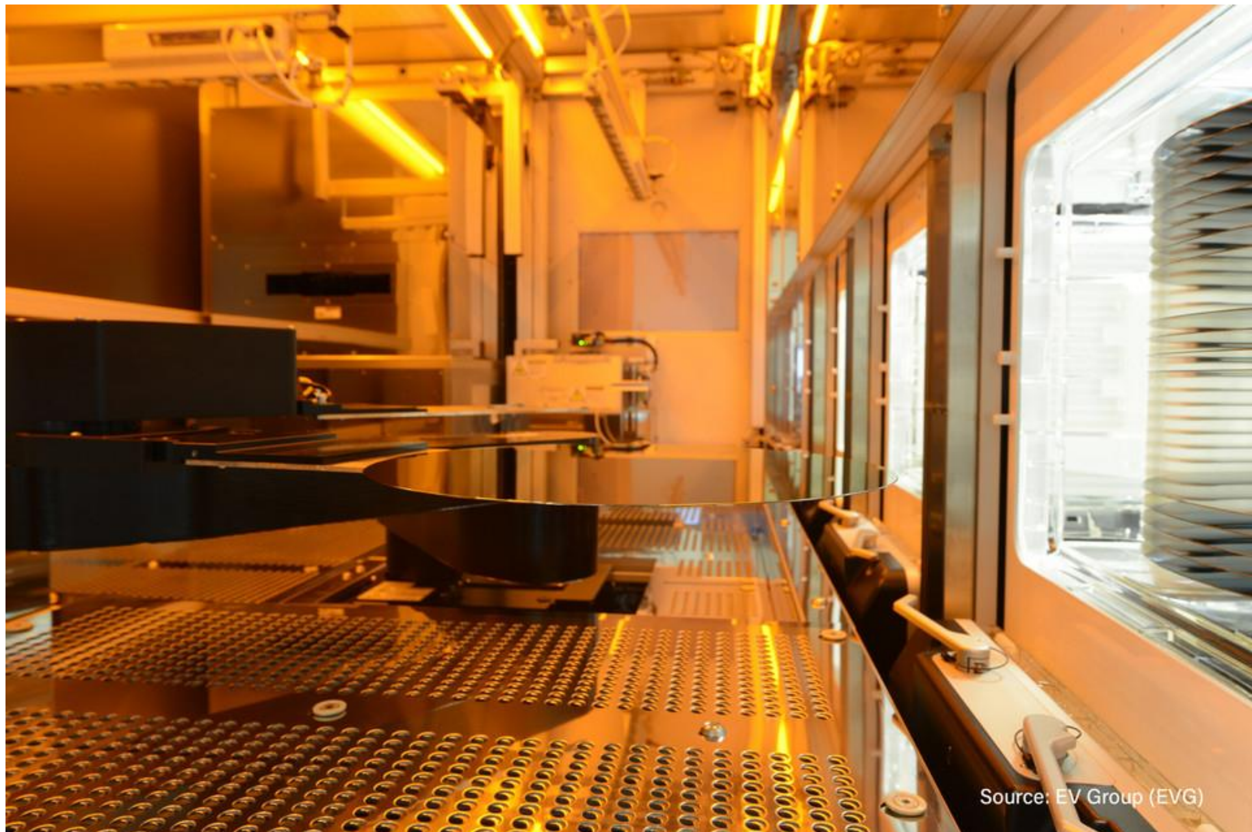

View inside the EVG850 NanoCleave layer release system, with the pre-processing module bay and the mechanical release module in the background.
EV Group(EVG) introduced the EVG850 Na

EV Group(EVG) introduced the EVG850 NanoCleave layer release system—the first product platform to feature EVG's revolutionary NanoCleave technology.

The EVG850 NanoCleave system enables nanometer-precision release of bonded, deposited or grown

layers from silicon carrier substrates using an infrared(IR) laser coupled with specially formulated inorganic release materials in a proven, high-volume-manufacturing(HVM) capable platform.

As a result, the EVG850 NanoCleave eliminates the need for glass carriers—enabling ultra-thin chiplet stacking for advanced packaging, as well as ultra-thin 3D layer stacking for front-end processing, including advanced logic, memory and power device formation, to support future 3D integration roadmaps.

The first EVG850 NanoCleave systems have already been installed at customer facilities, and nearly two dozen product demonstrations are underway with customers and partners at customer sites and EVG's headquarters.

In 3D integration, glass substrates have become an established method for building up device layers through temporary bonding with organic adhesives, using an ultraviolet(UV) wavelength laser to dissolve the adhesives and release the device layers, which are subsequently permanently bonded onto the final product wafer.

However, glass substrates are difficult to process with semiconductor fab equipment that have been designed primarily around silicon, and that require costly upgrades to enable glass substrate processing. In addition, organic adhesives are generally limited to processing temperatures below 300°C, limiting their use to back-end processing.

Enabling silicon carriers with inorganic release layers avoids these temperature and glass carrier compatibility issues. In addition, the nanometer precision of IR laser-initiated cleaving allows for processing extremely thin device wafers without changing processes of record.

Subsequent stacking of such thin device layers enables higher-bandwidth interconnects and new opportunities to design and segment dies for next-generation, high-performance devices.

The EVG850 NanoCleave utilizes an IR laser and inorganic release materials to enable laser cleaving from silicon carriers with nanometer precision in production environments.

The innovative process eliminates the need for glass substrates and organic adhesives, enabling front-end process compatibility for ultra-thin-layer transfer and downstream processes.

The most demanding front-end processing is supported by the EVG850 NanoCleave's high-temperature compatibility(up to 1000°C) while the room-temperature IR cleaving step ensures device layer and carrier substrate integrity. The layer transfer process also eliminates the need for expensive solvents associated with carrier wafer grinding, polishing and etching.

The EVG850 NanoCleave is based on the same platform as EVG's industry-leading EVG850 series of automated temporary bonding/debonding and silicon-on-insulator(SOI) bonding systems, with a compact design and HVM-proven wafer handling system.

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