

n news

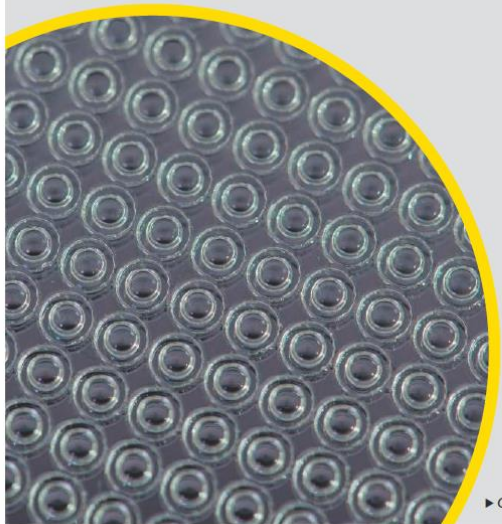
EV Group introduces EVG770 NT step-and-repeat nanoimprint lithography system

Austria-based EV Group (EVG) has introduced the EVG770 NT step-and-repeat nanoimprint lithography (NIL) system for precise replication of micro- and nano-patterns in large-area master stamp fabrication in high-volume manufacturing of augmented reality (AR) waveguides, wafer-level optics (WLO) and lab-on-a-chip (LOC) devices.

The EVG770 NT is a production-oriented system for cost-efficient and high-fidelity NIL patterning. It allows for stitch-free replication of up to 80 x 80 mm single-die master moulds on up to 300 mm wafers or Gen 2 (370 x 470 mm) panel substrates at sub-250 nm alignment accuracy and sub-50 nm resolution.



► The EVG770 NT step-and-repeat nanoimprint lithography (NIL) system.►



► Closeup of a 300 mm step-and-repeat master stamp for wafer-level optics (WLO).►

WLO is one of the main markets driving the adoption of step-and-repeat NIL, as it has allowed for the realisation of many mobile consumer electronic product improvements, from greater autofocus and facial recognition for smartphone cameras to 3D modelling and imaging enhancements for AR and virtual reality (VR) headsets. The step-and-repeat NIL process involves taking a single-die master mould that has been produced using electron-beam writing or another technology and replicating it multiple times across a wafer or panel substrate to create a full-area master stamp. This master stamp can then be used to produce working stamps for subsequent wafer- and panel-level manufacturing.

The EVG770 NT can replicate larger master moulds over larger substrates to create larger master stamps than its predecessors, ultimately allowing more devices to be produced simultaneously and larger individual devices to be production scaled. This approach offers significant yield and cost advantages over conventional mastering processes, such as diamond drilling, electron-beam writing and direct laser writing, these being difficult to scale up for larger substrates due to their low throughput and high cost of implementation.



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The EVG770 NT affords a number of features that aid in process development and production, such as:

- a high-dose exposure source design to significantly reduce exposure times;
- inspection microscopes and live process camera feeds to verify and monitor process results on the go;
- non-contact air bearings to minimise particle contamination;
- an automated substrate loading and stamp changing unit with storage buffer for five stamps;
- in-situ control and characterisation of imprinting and detachment forces; and
- EVG's latest computer integrated manufacturing (CIM) framework platform.

Dr Thomas Glinsner, corporate technology director at EVG, commented: "EV Group has invested more than a decade in developing and refining our step-and-repeat mastering technology to bring the manufacturing benefits of NIL to a wider range of markets and applications. The result of that effort has led to the EVG770 NT, which provides the missing link bridging freeform microoptics or high-fidelity nanopatterning with cost-efficient, large-scale production requirements. With this breakthrough step-and-repeat solution, our customers now have the ability to create their own master templates and bring the entire NIL process flow in-house, providing them with greater flexibility and faster turnaround on their production runs.

"For customers wishing to explore the use of NIL for new products or that have small production needs, EVG offers step-and-repeat mastering services within our NILPhotonics Competence Center, our open access innovation incubator for customers and partners that shortens the time to market for innovative photonic devices and applications." ●

EV Group
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