

Mastering service cuts nanoimprint litho costs – June 22, 2021



The Step-and-Repeat (S&R) Mastering Shop by EVG allows designers to develop nanoimprint lithography masks quickly and cost effectively

The EV Group (EVG) in Austria has set up a new clean room Step-and-Repeat (S&R) Mastering Shop to help developers use nanoimprint lithography (NIL) in high-volume manufacturing.

The EVG S&R Mastering Shop uses EVG's own equipment and cleanroom facilities to provide contract manufacturing of large-area master templates and stamps. These are used to produce working stamps for wafer-level and panel-level NIL processing for applications such as wave guides for augmented reality glasses, micro-optics for optical sensors, micro-lenses, nanophotonics and silicon photonics.

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This cuts out the capital costs of owning dedicated S&R systems for master stamp fabrication so that designers can more easily integrate NIL technology in their new product designs.

Using S&R mastering, a large-area master stamp can be produced from a single-die "hard master". This S&R master can then be used to replicate tens or hundreds of working stamps, which are used to imprint the functional structures on substrates.

This has significant yield and cost advantages compared to conventional mastering methods, such as diamond drilling, laser direct writing and electron-beam writing, which are difficult to scale up to larger substrates due to their low throughput and high cost of implementation.

The process also minimizes wear-out and risk of introducing defects to the expensive master and allows larger master molds to be replicated on 300mm wafers, panel-sized substrates and inserts for roll-to-roll (R2R) manufacturing. This allows more devices to be produced simultaneously as well as allows for the production scaling of larger individual devices without stitching.

EVG says it is the only company to offer the complete capability for S&R mastering and wafer-level NIL processing that enable rapid and cost-effective scaling of NIL-enabled products from R&D to high-volume production.

"EVG has pioneered the development and maturation of nanoimprint lithography with more than 20 years of experience in this innovative technology," said Markus Wimplinger, corporate technology development & IP director at EV Group. "We introduced our next-generation EVG 770NT step-and-repeat NIL system, which paved the way for large-scale master stamp fabrication for NIL volume production applications. Now with our S&R mastering services, EVG is eliminating even more barriers to NIL adoption for our customers by providing a one-stop shop for structured masters within a flexible and cost-effective service model."

The EVG770 NT step-and-repeat NIL system enables large-area master stamp fabrication on substrate sizes up to 300-mm wafers and 370mm x 470mm panels. All core infrastructure is located in an access-controlled environment and operated by a dedicated team to maintain protection of customer IP.

In addition to producing master stamps, EVG also offers the ability to produce working stamps and original hard masters for customers. As part of its NILPhotonics Competence Center, EVG also offers imprint process development, materials qualification and optimization, as well as device prototyping and pilot-line manufacturing .

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