

Step and Repeat

Nanoimprint solutions for the large-scale production of flexible shims and innovative end prototypes

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MATERIALS

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Advantages:

- cost-effective
- industry-compatible
- flexible
- accurate positioning

Technical data:

Technology:

- UV nanoimprinting

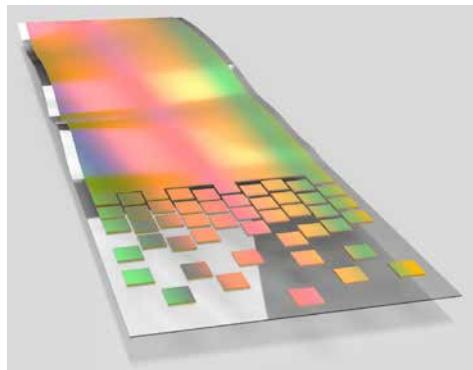
Maximum substrate surface:

- Width: 380 mm
- Length: 700 mm

Position accuracy

Stage:

- 3 µm



MATERIALS uses a specially modified EVG770 nanoimprint lithography (NIL) stepper for the production of flexible embossing tools for roller-based NIL in the fields of photonics, functional surfaces and microfluidic systems.

Nanoimprint lithography is, compared to other lithographic methods, a cost-effective structuring technology and therefore ideally suited for the use in high volume manufacturing processes. However, the associated time for the production of working stamps (shims) for industrial roll-to-roll imprinting as well as their cost is still significant.

By the development of the step+repeat technology for large-area foil substrates MATERIALS was able to close the gap between small format masters and large-area shims.

This enables a remarkably higher process flexibility and further reduction of process costs in the field of nanoimprint technology. The adaptation of the EVG770 system together with EV Group included a sample intake extension for wafer geometries on large-area foil substrates. Using UV-NIL step+repeat technology, flexible

polymer-based shims are created for the use in roll-to-roll imprinting processes. The new approach combines the **very high positioning accuracy** known from semiconductor technology with foil-based high-throughput methods and offers a cost-effective and industry-compatible alternative to the direct use of conventional time consuming nanostructuring methods.

MATERIALS offers research pilot lines for the development and implementation of new product ideas and manufacturing processes to its customers and partners, from the idea to the prototype. The **pilot line for roll-to-roll micro- and nanostructuring** covers simulation, design and material development (coatings, imprint resins) and offers large-scale structuring and structure replication from mastering to roller-based manufacturing. The EVG770 NIL stepper completes this pilot line with regard to the production of large-area working stamps.