EVG®770 GEN II NIL Stepper

Introduction

EV Group introduces the 2nd generation EVG770 – a new, flagship solution for step and repeat nanoimprint lithography. Implementing a unique approach, this system addresses large-area master fabrication for optical applications and replication of high-resolution features for nanooptics and nanoelectronics for wafers from 100 mm to 300 mm.
The EVG770 step and repeat system supports hard and soft UV-NIL as well as micro-contact printing applications. Special system features include a dual-stage alignment approach for excellent overlay, a high-precision wafer stage and a unique imprint head which allows for real time and in-situ characterization of embossing and de-embossing forces of various commercial available resists or anti sticking layers. Additionally, a resist drop dispensing system for viscosities between 1 to several 1,000 mPas which improves the process flexibility for micro- and nano patterning. The EVG770 is abel to imprint in vacuum, which enables superior pattern fidelity, yield, and device performance. The system supports semi- and fully-automated wafer and template transfer.

EVG®770 NIL Stepper installed at EVG's headquarter clean room

Markets

Large area master fabrication:

- Image sensor optics – e.g. cell phones
- Full-field replication of high resolution features

Optics:

- µ-lens arrays
- Waveguides
- Ring resonators

R&D for Nanoelectronics:

- Dual-damascene
- Contact holes
- First print for fine feature resolution

System Specifications

Processes	• Hard UV NIL • Soft UV NIL • Micro Contact Printing
Alignment capability	• Standard: 500 nm overlay alignment accuracy • Fine Alignment: 50nm (optional) • First Print Alignment: <200nm
Imprint environment	• Vacuum down to < 50 mbar (patent pending) • Inert gases like Argon or Helium
UV exposure	• Broad band exposure • Lamp intensity: ~ 20 mW/cm² • Wavelength: 300 nm to 500 nm • Exposure through transparent stamp
Resist processing	• Standard coating techniques like spin coating • Ink Jet or drop on demand
Handling	• Semi automated: Substrate loading/ unloading manually • Automated: Substrate loading/ unloading fully automated from FOUP or SMIF pods (Semi Standards) • Automated template loading is standard on all systems (e.g. semi and fully-automated)

Results

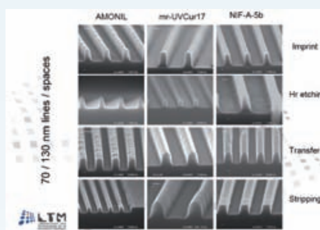

Fig.1: High resolution features (70 nm lines and 130 nm space) imprinted on an EVG®770 | Courtesy of LETI / LTM

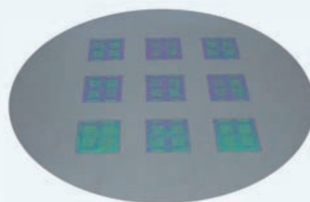

Fig.2: 200 mm wafer imprinted with 9 dies (25 mm x 25 mm) utilizing soft polymer stamps

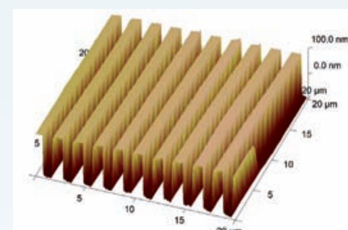

Fig.3: AFM picture of 1 µm line and space structures processed on EVG®770 (Close up of Fig.2)

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