Germanlitho
天仁微纳

GL4 R&D

Multifunctional nanoimprint lithography equipment for R&D or small volume production.

Introduction

The GL4 R&D is a powerful multi-functional nanoimprint lithography (NIL) equipment designed specifically for universities, research institutes and enterprise R&D departments. The equipment can be configured with multiple nanoimprint modules, including high resolution UV-NIL, WLO (Wafer Level Optics) NIL, and thermal NIL (HE - Hot Embossing) enabling myriad NIL processes to be carried out on one flexible machine.The UV-NIL module enables imprinting of high resolution (higher than 10nm *) and high-aspect-ratio (greater than 10： 1 *) nanostructures on up to 100mm spin-coated wafers. The WLO NIL module is equipped with a precise resist dispensing system and APC (Automatic mold/substrate Parallel Control) technology, ensuring imprint fidelity, large-area uniformity and yield for wafer-level optics imprinting. The alignment system enables the Wafer Level Stacking (WLS) process. The use of uniform gas pressure in the thermal NIL module guarantees large-area imprinting uniformity and replication fidelity. The GL4 R&D is suitable for the development of a wide range of nanoimprint processes, rapid device prototyping, nanoimprint material testing and other R&D activities. It follows the processes and material system of GermanLitho's mass production NIL equipment, allowing processes developed on GL4 R&D to be efficiently adapted to any our mass production devices. Application fields of the GL4 R&D include DOEs, AR waveguides (including slanted grating), WGPs, metalenses, biochips, LEDs, MLAs, diffusers and myriad other products

Technical Data

Configuration option	UV-NIL module	WLO imprint module (optional)	Thermal NIL module (optional)
Substrate size	20x20mm substrate, 2inch, 3inch, 100mm wafers (Special sizes can be customized)		
Substrate material	Silicon, glass, quartz, plastic, metal, etc.		
Supported NIL process	High resolution UV-NIL on spin-coated wafers UV-NIL for WLO process (optional) thermal-NIL (Hot Embossing - HE) process (optional) Simultaneous UV-NIL & thermal-NIL in one imprint sequence (optional)		
Resolution	Higher than 10 nm*		
Aspect ratio	Greater than 10:1*		
Residual Layer Thickness (RLT) /TTV control	RTL less than 10nm*	TTV in μm accuracy*	RTL less than 10nm*
UV curing light source	High power UV LED panel light source (365nm), light intensity >300mw/cm²		
Automatic imprinting	Supported		
Automatic separation	Supported		
Automatic working stamp replication	Supported		
Automatic resist dispensing	/	Supported	/
APC (Active mold/substrate Parallel Control)	/	Supported	/
Pressure application method	/	/	Uniform gas pressure guarantees large-area imprint uniformity
Imprint pressure	/	/	≤50bar (80bar customized)
Imprint Temperature	/	/	RT ~ 250℃, setting accuracy ±1℃
Mini-environment and climate control	Standard, external environment class 100, internal environment better than class10*		
Alignment	Manual alignment, automatic alignment (optional)		
Wafer loading & unloading	Manual loading and unloading		

* Parameters depend on the mold, material, process and operating environment, not equipment limits

* GermanLitho reserves the right to interpret the information

Features

- Following the processes and material system of GermanLitho's mass production nanoimprint equipment, any developed process can be efficiently adapted to the mass production equipment.
- Flexible optional configurations include a high-resolution UV-NIL module, a WLO NIL module and a thermal NIL module that can be quickly and easily switched.
- Max. imprinting area Φ100mm.
- Automatic internal replication of flexible composite working stamps, reducing the cost of large-area molds in nanoimprint processes.
- Automatic NIL processes including working stamp replication, imprinting, curing and separation.
- APC (Active mold/substrate Parallel Control) technology used in the WLO module, guarantees large area TTV uniformity of imprinted wafers.
- Including automatic high-precision resist dispensing function.
- Uniform gas pressure up to 50bar (80bar can be customized) guarantees large-area imprinting uniformity and replication fidelity in thermal NIL processes. UV and thermal-NIL processes can be carried out separately or in-situ in one simultaneous imprint sequence.
- High power UV LED panel (365nm, light intensity >300mW/cm²), light sources of different power and wavelength can be provided according to customer specifications, perfectly supporting a variety of commercial nanoimprint materials.
- Optional alignment function.
- Based on our experiences, we have created nanoimprint process and material starter-kits to be delivered with our products, enabling our customers to immediately make use of the world-leading level of nanoimprint technology.

OUR CONTACT!

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