

SINDRE® Integra

NIL TOOLS FOR HVM



HIGHLIGHTS

- Fully automated production tool
- Industry leading Cost-of-Ownership
- Up to 70 wafers/hour and high yield
- In-line CVD anti-stick of IPS®
- In-line IPS® resist coating
- Sub 50nm resolution

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SINDRE® Integra

GENERAL INFORMATION

Key Features

- The fully automated SINDRE® Integra NIL tools provides reliable, high-volume manufacturing capabilities – combining sub 50 nm resolution and excellent CD-control.
- The SINDRE® Integra tools enables cost-efficient high-volume manufacturing. High quality engineering ensures high repeatability, low maintenance cost and a high yield – all this provides for a highly competitive CoO.
- The SINDRE® tools are suitable for use within several application areas such as Optics and Photonics, Bio and Medical Devices, LEDs, Micro- and Mini LED displays, MEMS and Sensors.
- The SoftPress® technology ensures imprint uniformity all the way to the edges of the substrate, without the need of any planarization layers.
- IPS® technology increase stamp life and eliminates the risk of substrate breakage. The manufacturing of the IPS is integrated into the system which ensures high quality and contamination free working stamps.
- In-line IPS resist coating.
- Configurable UV-intensity levels from 100-400 mW/cm² at substrate level.
- In-line CVD anti-stick of IPS enabling higher yield and reducing material compatibility issues resulting in a wider process window.
- The tools repeatable performance enables a simple up- and downstream processing.
- Customized configurations for different substrate sizes and shapes possible.
- Designed according to European safety regulations and CE Mark.



NIL for high-volume manufacturing

SINDRE® Integra

GENERAL INFORMATION

Obducat's NIL Process Technologies

IPS® - Intermediate Polymer Stamp

The patented IPS® technology is based on making a replication of the master stamp into a soft Intermediate Polymer Stamp (IPS®). The IPS® is then used in a second imprint step to transfer the structures onto the target substrate.

The IPS® enables contamination control, increases the master stamp lifetime and makes the imprint process less sensitive to substrate contaminations and surface roughness.

SoftPress®

With Obducat's patented SoftPress® technology, the imprint pressure is applied using compressed gas, ensuring pressure uniformity over the entire imprint area. This allows the stamp or IPS® to conform to the substrate, eliminating negative effects from thickness variations, bow or waviness. SoftPress® enables thin and uniform residual layer across the substrate, which is critical for enabling high-resolution imprinting and pattern transfer fidelity.

STU® - Simultaneous Thermal and UV

The patented STU® technology combines, in one imprint sequence, the simultaneous use of thermal- and UV based imprint processes. The STU® process allows for increased polymer flow rate giving a shorter process time as well as enabling improved material compatibility and thereby a wider selection of workable imprint materials.

Automated IPS® application and demolding

The patented automated demolding function developed by Obducat for use with the patented IPS® and SoftPress® technologies makes the application of the IPS® material accurate and repeatable, ensuring that the pattern fidelity is maintained. The automated demolding function also protects the stamp from any manual handling during the imprint process.

In-line IPS® resist coating

The in-line resist coating of the IPS®, allows for a much wider selection of carrier film material as well as IPS resist material. The customer will have the possibility to tailor the process by matching carrier materials and resist materials. Furthermore, the customer can also optimize the selection of the IPS materials to maximize the number of times the IPS can be used.

TOOL CONFIGURATIONS

The Imprint System consists of two imprint chambers based on Soft Press® technology (one chamber for IPS® imprint and one chamber equipped with 2 interchangeable chucks for substrate imprint), IPS® Foil Handling System, In-line IPS resist coating, In-line anti-stick treatment of the IPS, Substrate Handling System, Computer Controlled User Interface (for control and analysis of the imprint process, log files and equipment diagnostics), Integrated HEPA Filter.

Throughput	Up to 70 wph
Stamp Change time	< 30 min
Substrate Handling	Automated Cassette-to-Cassette wafer handling
Substrate Size	2-8 inch Ø with dimensions and tolerances in accordance with SEMI M1.1-89, M1.2-89 and M1.5-89 standards. (other configurations possible using optional special substrate chucks)
Imprint Pressure (minimum)	5 bar
Imprint Pressure (maximum)	50 bar
Imprint Pressure Accuracy	± 1 bar
Imprint Temperature (Minimum)	Ambient temperature
Imprint Temperature (Maximum)	200°C
Imprint Temperature Field Uniformity	± 3°C (RT to 100°C) ± 3 % (100°C to 200°C)
Imprint Temperature Setting Accuracy	± 2°C
UV Module Specification	
UV WaveLengths	365nm
UV Light Power at Sample	100-400 mW / cm ²
System Performance	
Mini Environment	Class 10 (when installed in Class 100 clean room)

SYSTEM DIMENSIONS

Dimensions (L x W x H)	271 x 150 x 218 cm
Weight	Approx. 1 850 kg

FACILITY REQUIREMENTS

Clean-room compability	Class 100
Room Temperature	18-23°C
Relatively Humidity	40 - 65 %
Power	400 VAC, 3 phase, grounded, prefused to 32A, 50/60 Hz, 20 kVA
Compressed Air	6 - 8 bar, mn 40 l / min, peak 100 l / min
High pressure Nitrogen or Air	
Pressure	60 bar (870 psi)
Flow	600 l/min @ peak. Consumption is 15 liter bar/min
Connection	DIN 10, machine equipped w 1/4" Swagelok, tube fitting, female
Quality	N48 or better, filtered to 0,5 µm (Nitrogen) / Dry & filtered to 0.01 µm / 0.01 ppm (CDA)
Exhaust	
Outlets	3 (plus one for the chiller)
Size	Ø100mm (Exhaust hose inner diameter 102mm)
Total Flow	4500 l/min (9500 l/min incl. chiller exhaust)
Flow per Outlet	1500 l/min
Facility water	
Pressure	5 Bar
Maximum Current	10 l/min

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