



PICOMASTER

When ultimate resolution matters

PICOMASTER Series

- Single focused beam writing strategy
- Grayscale lithography
- Resolution down to 0.3 μm

MASKLESS LASER BEAM LITHOGRAPHY

RAITH

RAITH
NANOFABRICATION

PICOMASTER

PICOMASTER is a family of low-maintenance, versatile, high-resolution maskless laser writers which offer best-in-class resolution and full grayscale capabilities at non-compromised speed.

PICOMASTER is a **PROPER** tool for your lab:

Precision

Offering high-precision laser power control for even fine doses, autofocus even on challenging samples, and alignment accuracy

Resolution

Enabling best-in-class resolution for both features and gratings, with periodicity down to sub-300 nm features

Optimization

Can be optimized to any type of application by selecting tabletop or standalone system, appropriate laser source wavelengths, and different writing modes

Profilng

Providing an ultimate grayscale capability up to 4096 levels without affecting exposure speed for best-in-class 2.5D resist profiling

Ease of use

Inhouse-designed aligning tools for simple sample handling and a powerful user interface for convenience in working with most common file formats

Reduced maintenance cost

Smooth, quick, and cost-efficient service with maintenance-free motion platform and long-life optical module (10,000 hours), which is easy to replace without engineer on-site

Table of parameters



PICOMASTER 100



PICOMASTER 150



PICOMASTER 200

Performance

Minimum line width (CD) *process-related	300 nm											
Minimum grating periodicity	600 nm											
Line width uniformity (CDU) @ 300 nm resolution	50 nm											
Edge roughness @ 300 nm resolution	30 nm											
Writing modes	Raster and vector											
Spot sizes	0.3 μm	0.6 μm	0.9 μm	5 μm	0.3 μm	0.6 μm	0.9 μm	5 μm	0.3 μm	0.6 μm	0.9 μm	5 μm
Maximum write speed in raster mode *may affect edge roughness *exposure field-related	2.1 mm ² /min	4.2 mm ² /min	6.4 mm ² /min	35 mm ² /min	2.1 mm ² /min	4.2 mm ² /min	6.4 mm ² /min	35 mm ² /min	2.6 mm ² /min	5.3 mm ² /min	7.7 mm ² /min	43 mm ² /min

Optics

Light source	GaN laser diode											
Wavelength	405 nm / 375 nm											
Source lifetime	10000 h / 8000 h											
Grayscale level	4096											
Autofocus type	Proprietary real-time optical autofocus capable of exposure right up to the edge of the substrate, including transparent materials											
Autofocus range	600 μm											

Alignment

Top side alignment accuracy	250 nm											
Back side alignment accuracy	2000 nm											

Mechanics

Maximum exposable area	100 x 100 mm ²				150 x 150 mm ²				200 x 200 mm ²			
Repeatability (RMS)	20 nm											
Axis encoder resolution	2 nm											

Substrate

Minimum substrate size	5 x 5 mm ²											
Maximum substrate size	125 x 125 mm ²				175 x 175 mm ²				230 x 230 mm ²			
Maximum substrate thickness	12 mm											

Software

Supported file types (*offline conversion required)	GDSII, BMP, TIFF, STL, DXF*, CIF*, GBR*											
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Dimensions

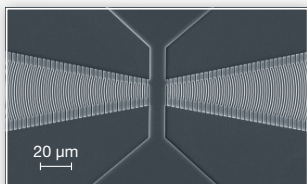
Dimensions (WxDxH)	600 mm x 770 mm x 750 mm				880 mm x 1300 mm x 1900 mm				880 mm x 1300 mm x 1900 mm			
Weight	260 kg				700 kg				700 kg			

Applications

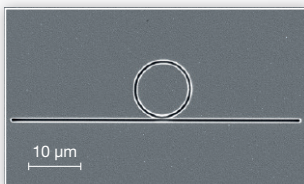
The versatility of the PICOMASTER series allows users to work on a wide range of applications including

- semiconductors
- electronics
- photonics
- mask-making
- 3D lithography
- diffractive optical elements
- microfluidics
- RF devices
- MEMS
- LED
- flat panels
- AR/VR devices

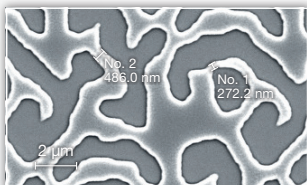
Actuator



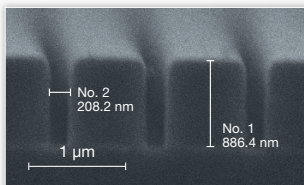
Resonator



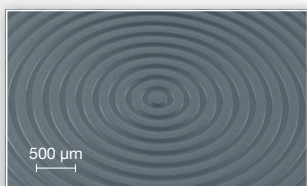
Diffractive optical element



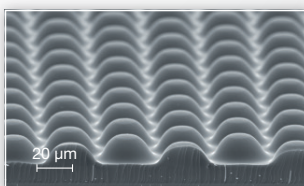
High resolution grating



Zone plate



Microlens array





Systems for nanofabrication

About Raith

Raith is a leading precision technology solution provider for micro- and nanofabrication, electron beam lithography, focused ion beam fabrication, maskless laser lithography, nanoengineering, process control, and reverse engineering applications. The company offers solutions for researchers and engineers in both academic and industry settings.

Founded in 1980 and headquartered in Dortmund, Germany, Raith employs around 300 people. The company works closely with customers in the most important global markets through subsidiaries in the Netherlands, the USA, and Asia and through an extensive partner and service network.

In February 2013 Raith joined forces with Vistec Gaussian Beam Lithography, another leading lithography equipment manufacturer with more than 45 years of experience. With this ideal extension to the product portfolio, customers are now able to select from a comprehensive range of nanofabrication systems.

In July 2021 Raith acquired 4PICO Litho, expanding its nanofabrication portfolio to take in maskless laser lithography.

Raith customers benefit from innovative, intelligently configured high-tech systems at an excellent price-performance ratio. With the world's largest service and support infrastructure in the area of nanofabrication, the world's greatest customer community, and highly trained personnel, customers can be sure of making a solid investment with the company.

Get in touch

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www.raith.com/company/locations-representatives

