PICOMASTER XF

PICOMASTER XF is a low-maintenance, versatile, high-throughput multibeam maskless laser writer which offers submicron resolution and full grayscale capabilities at highest speed.

PICOMASTER XF is a FASTER tool for your lab:

Flexibility

Can be flexibly built to meet requirements of the most challenging applications by adding autoloading system, large-size substrate writing capabilities (up to meters), full process integrated workbench

Accuracy

Offering high accuracy in laser power control to ensure precise doses, autofocus accuracy even on challenging samples and close to sample edges, and alignment accuracy down to 0.25 µm

Speed

Offering multibeam exposure technology, PICOMASTER XF is over 100 times faster compared to single beam machines, achieving writing of a full 6” wafer in 1 hour

Throughput

The PICOMASTER XF’s multibeam exposure technology, fast and precise stage mechanics, and software buffering system ensure stable high throughput

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

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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For all locations and more contact details visit:
www.raith.com/company/locations-representatives

PICOMASTER XF

When ultimate speed matters

PICOMASTER XF Series

- Parallel multi beam writing strategy
- Write speed up to 280 mm²/min
- Edge to edge exposure
- 0.6 µm resolution

MASKLESS LASER BEAM LITHOGRAPHY

RAITH
NANOFABRICATION

Table of parameters

PICOMASTER XF200

Performance

Minimum line width (CD) *process-related	600 nm
Minimum grating periodicity	1200 nm
Line width uniformity (CDU) @ 300 nm resolution	75 nm
Edge roughness @ 300 nm resolution	40 nm
Writing modes	Raster
Spot sizes	0.6 µm
Maximum write speed in raster mode *may affect edge roughness *exposure field-related	280 mm^2/min
Exposure time for 150x150 mm *for XF	60 min @ 0.6 µm

Optics

Light source	GaN laser diode
Wavelength	405 nm
Source lifetime	10000 h
Grayscale level	256
Autofocus type	Proprietary real-time optical autofocus capable of exposure right up to the edge of the substrate, including transparent materials
Autofocus range	400 µm

Alignment

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

Mechanics

Maximum exposable area	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	250 x 250 mm^2
Maximum substrate thickness	14 mm

Software

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

Dimensions

Dimensions (WxDxH)	1470 mm x 1420 mm x 2080 mm
Weight	1250 kg

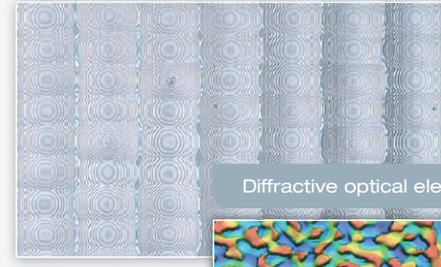
Disclaimer: Resolution is guaranteed on specific types of resists and thicknesses. Write speed specified for maximum exposable area.

Applications

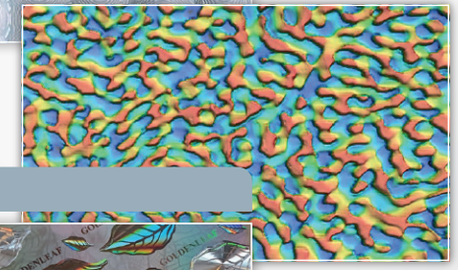
The high speed of the PICOMASTER XF enables it to be used as a research tool in a lab as well as a powerful production node for

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

Diffusor



Diffractive optical element



Hologram