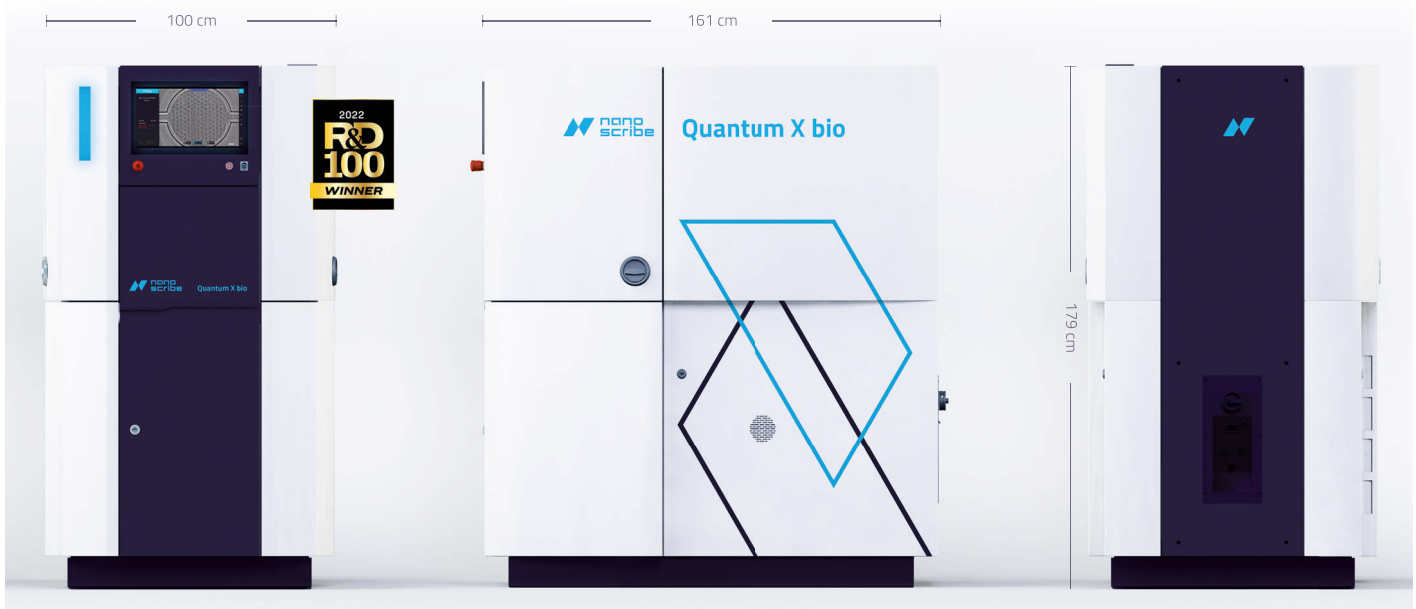


High-resolution 3D bioprinter

3D printing for life sciences and microfluidics

Quantum X bio is a highly versatile, high-resolution 3D bioprinter powered by Two-Photon Polymerization (2PP). It offers unmatched freedom in diverse substrates and biomaterials, from polymers to hydrogels. It enables the fabrication of intricate structures ranging from subcellular

millimeter scale and supports sterile printing for biomedical research, tissue engineering, and microfluidic applications. The bioprinting chamber provides essential environmental control, such as temperature and humidity control, HEPA-filtered airflow for sterile conditions, and premixed air/CO₂ supply.



FEATURES

included

- ▶ High-resolution bioprinting process with feature sizes down to $\leq 1 \mu\text{m}$ for subcellular structures based on 2PP
- ▶ CO₂, temperature, and humidity control, with heatable cell culture dishes enabled by the Bioprinting Set
- ▶ Holders for a wide variety of substrates such as microscope slides and cell dishes
- ▶ Access to the Bioprinting Model Library

optional

- ▶ Ultra-fast 2.5D printing enabled by Two-Photon Grayscale Lithography 2GL®
- ▶ Ultra-fast 3D printing by 2GL®
- ▶ Aligned 3D printing on various substrates enabled by Aligned 2-Photon Lithography A2PL®

FOCUS APPLICATIONS



High-res 3D printing



High-res 3D biofabrication



Optics manufacturing



2.5D surface patterning

SOFTWARE

included

- ▶ DeScribeX for 3D printing by 2PP
- ▶ nanoConnectX for remote control of the printer

optional

- ▶ nanoPrintX for aligned 3D printing and 3D printing by 2GL®
- ▶ GrayScribeX for 2.5D printing with 2GL®

Benchmark scores *

Feature size control ¹	down to 100 nm
Stitching-free part diameter	up to 4,000 µm
Maximum scan speed	6.25 m/s divided by lens magnification
Live-cell printing viability	> 90%

* Peak values, only achieved under specific conditions such as printing parameters, print heads, photoresins, and designs.

General system properties

Printing setup	Upright system enabling high-resolution 3D printing with flexible DiLL and non-DiLL setups to suit various material and application requirements.
Laser source	Femtosecond laser (780 nm), avg. power 250 mW
Laser safety	Class 1 (IEC 60825-1)
Voxel modulation rate	1,000 kHz
Positioning volume	150 x 150 x 20 mm ³ , stage repeatability ≤ 150 nm
Substrates	Microscope slides / microfluidic chips (3" x 1" / 76 mm x 26 mm) Cell culture imaging dishes (glass bottom, 35 mm or 50 mm) Flat substrates (up to 100 x 100 mm ²) Glass, silicon, other transparent and opaque materials
Photoresins	Open system for custom materials Hydrogels/Bioresins from Advanced BioMatrix, Cellink, and BIO INX Nanoscribe photoresins (polymer printing) Nanoscribe GP-Silica (glass printing)
Noise emission	36 dB LpA
System dimensions (L x W x H)	161 x 100 x 179 cm ³
Weight	Up to 1,350 kg

Print head specific properties

	SF	MF	LF	XLF
Magnification / NA	63x / 1.4	25x / 0.8	10x / 0.3	5x / 0.16
Print mode	Dip-in ²	Dip-in ²	Dip-in ²	Air
Working distance	360 µm	380 µm	2,600 µm	18,500 µm
Field of view diameter (max.)	400 µm	800 µm	2,300 µm	5,000 µm
Calibrated print field diameter	270 µm	700 µm	1,750 µm	3,500 µm
Scan speed (max.)	100 mm/s	250 mm/s	625 mm/s	1,250 mm/s

Process specific properties: 3D printing (2PP)

	SF	MF	LF	XLF
Voxel size (xy / z) (typical)	0.2 µm / 0.5 µm	0.6 µm / 3.6 µm	1.2 µm / 12 µm	2 µm / 40 µm
Slicing distance (typical range)	0.1 – 0.8 µm	0.5 – 3 µm	2 – 10 µm	5 – 100 µm

Process specific properties: 2.5D surface patterning (2GL)

included / optional

	SF	MF	LF
Print height (typical)	1 – 10 µm	10 – 150 µm	50 – 700 µm
Shape accuracy (P – V) (typical)	1 % relative deviation		
Height tolerance	1 %; min. ± 400 nm		

SF: Small Features, MF: Medium Features, LF: Large Features, XLF: Extra Large Features

Software

included / optional

nanoPrintX basic version	Process parameter presets for 2PP-based 3D printing included Compatible with alignment routines Input format: STL, OBJ, lens formula
nanoPrintX 3D printing by 2GL version	<i>Additional features compared to the nanoPrintX basic version:</i> Process parameter presets for 3D printing by 2GL® included Throughput increase of up to 60x times at high quality Quality increase at same throughput
GrayScribeX	Software for 2.5D structures with 2GL® 2GL stitching for seamless prints Input format: STL, grayscale images
DeScribeX	3D printing preparation software for classic 2PP Process parameter presets for 2PP-based 3D printing included Parameter sweeps, STL scaling, print preview and simulation Input format: STL, plain text coordinates
Printer touchscreen	User interface with print job management, live-view camera and two navigation cameras, and a 3D model view "Tap to align" function for printing aligned to any position on a substrate
nanoConnectX	Remote control of the printer with complete replication of the touchscreen functionality

Application Sets

included / optional

Bioprinting Set

Temperature control range	Up to 50 °C, stability ± 0.5 °C
Humidity control range	55 – 90% RH at 37 °C, stability $\pm 1\%$ RH
Gas flow	HEPA-filtered air (exchangeable filters), connection for external supply of premixed CO ₂
Compatible substrates	Cell culture imaging dishes (glass bottom, 35 mm or 50 mm)
Reliable results	Sterilizable parts Sterile consumables and biomaterials Sensor and video data collection
Bioprinting Model Library	Access to a collection of verified, ready-to-use designs for common structures and applications

Site requirements

Conditions	21 °C (± 1 °C); 35-65 % relative humidity
Environment	Yellow light (> 520 nm) recommended, low dust, low vibration
Power supply	100 - 240 V, 50/60 Hz, standard electrical connection
Power consumption	400 W (typical)
Compressed air supply ³	6 - 8 bar

Specifications are subject to change without notice and may vary depending on the photoresin, print head and structure geometry.

¹ in x/y direction

² It is possible to avoid contact with the photoresin

³ Compressor available on request

Datasheet valid from January 2026

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