

# NANOFABRICATOR™ 2

## Technical Specification

<b>Printing process</b>	Deposition technology	Microreactor selective area direct atomic layer processing ( $\mu$ SADALP) with ALD mode
	Lateral resolution	400 $\mu\text{m}^*$ (100 $\mu\text{m}$ in development)
	Vertical resolution	0.1 nm
	Printing speed	Up to 500 mm/s
	Materials**	Up to 450**
	# of precursors	Up to 6 + oxygen line and ozone generator
	Atmosphere	1. Ambient atmospheric conditions 2. Controlled Argon or Nitrogen ambient
	Pressure	Atmospheric / slight overpressure
	Printhead alignment	Manual / automatic
	Printhead tilting	Automatic
	# of printheads	1
<b>Samples and materials</b>	Compatible surfaces	Flat, corrugated up to 20 $\mu\text{m}$ , porous***
	Sample substrate material	Process-dependent, compatible with common semiconductor & metallic substrates, high-temperature polymers possible****
	Sample size	Up to 300 mm*****
	Sample heating temperature range	Room temperature to 300C +/- 5C
<b>IT</b>	Network connectivity	Ethernet
	Software	Fully automated control system and recipe editor
<b>Safety / monitoring features</b>	Safety features	Hermetically sealed, fire-resistant, and ventilated gas and electric cabinet
<b>System specifications</b>	Footprint – tool size	D 100 cm x H 200 cm x W 250 cm *****
	Weight	400 kg
	Power supply	3-phase 32 A 3-phase 16 A 230 V, 50-60 Hz
	Gas line connections	Argon line connection required Nitrogen line connection required Oxygen line connection required Compressed air line connection required Vacuum line connection required
	Exhaust connections	For electric box For gas box For printing unit For printhead, should be connected to absorption or decomposition filter (not provided with the system)

\*Lateral resolution improvements pending new interchangeable nozzles

\*\*Currently tested TiO<sub>2</sub>, Pt, ZnO, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>. Continuous testing ongoing

\*\*\*Maximum flatness nozzle size dependent, curved surfaces require separate customized nozzle

\*\*\*\*Compatible substrate materials are based on deposition process parameters

\*\*\*\*\*Dedicated chuck for circular samples

\*\*\*\*\*Form factor can be customized based on selected modular design