Allegato L1 - Rispetto dei requisiti essenziali (Lotto 1)

Nanoscribe GmbH & Co.KG						
Elements	**Essential requirements**		**Min. value**	**Max. value**	**VERIFICA COMMISSIONE (SI/NO)**	**NOTE**
2-photon lithography 3D printer	1.1	**2-photon** lithography system able to 3D print objects such as: •cellular constructs •micro-optics, micromechanics, or microfluidics components			SI	OK
	1.2	Printing area (mm2)	50x50	-	SI	the addressable volume is 50 x 50 x 20 mm^3
	1.3	Printing height (mm)	20		SI	the addressable volume is 50 x 50 x 20 mm^3
	1.4	Femtosecond laser source, with emission wavelength between (nm):	700	800	SI	laser wavelength is 780 nm
	1.5	3D bioprinting module for printing cellular constructs in a sterile and controlled environment (temperature and humidity) to ensure cells viability			SI	The bioprinting chamber creates a sterile environment with temperature and humidity control, a HEPA-filtered airflow and optional connection for pre-mixed air/CO2, ready to work with aqueous biomaterials and cells. Regarding sterility: • nearly all internal surfaces are made from stainless steel or aluminum and can be wiped with 70% ethanol for disinfection • autoclavable parts • For bioprinting, we offer sterile consumables by our sister company MatTek and sterile materials by the sister companies Advanced BioMatrix and Cellink. • Furthermore: we offer more bio-materials by our partner BioInx as photoresins for biosciences and engineering.
	1.6	Usage under standard laboratory conditions, without needing a clean room			SI	Dettagliato: No explicit clean room conditions required Installation in a clean room after consultation with Nanoscribe Support
High-resolution 3D printing (magnification 40x or higher)	2.1	Scan / writing speed (mm/s)	100		SI	maximum line speed 100 mm/s
	2.2	Horizontal feature size in the xy plane (µm)		0.25	SI	it provides voxel sizes down to 200 nm in xy and 500 nm in axial direction
	2.3	Vertical feature size along the z-axis (µm)		0.6	SI	it provides voxel sizes down to 200 nm in xy and 500 nm in axial direction
Low-resolution 3D printing (magnification 5x or lower)	3.1	Scan / writing speed (mm/s)	1000		SI	Maximum line speed 1250 mm/s
	3.2	Horizontal feature size in the xy plane (µm)		2	SI	it provides voxel sizes down to 2 µm in xy and 40 µm in axial direction according to the data sheet
	3.3	Vertical feature size along the z-axis (µm)		50	SI	it provides voxel sizes down to 2 µm in xy and 40 µm in axial direction according to the data sheet
Software interface	4.1	Graphical interface for the definition of geometries and printing parameters			SI	NanoPrintX, as a graphical interface
	4.2	Compatibility with 3D CAD files from third-party software			SI	Compatibility to 3D CAD files from third-party software via upload of a STL or OBJ File.
	4.3	Set of predefined parameters for best printing according to material and resolution included			SI	Ci sono ricette pronte per le diverse resine
	4.4	3D preview of the printing process, with process duration estimation			SI	OK

Printing materials	5.1	Possibility to use non-proprietary commercial materials (including generic light-curable materials, such as SU-8 – albeit optimal printing resolution cannot be guaranteed)			SI	Other compatible materials that are commercially available: • SU-8: standard resin used in lithography • AZ MIR 701: thin-film resin used for high-resolution, high-speed patterning. • AZ 5214E: thin-film resin used for low-resolution, high-speed patterning. • AZ 9260: thick-film resin used for patterning with a high aspect ratio. • AZ 40XT: thick-film resin used for patterning with a low aspect ratio. • Ormocomp: hybrid polymer photoresin, protein-binding in general, most photoresists available for i-line UV lithography are compatible with Quantum X. For example, in which these photoresins were used with Nanoscribe systems: AZ9260: http://dx.doi.org/10.1016/j.matdes.2022.110836 SU-8: https://doi.org/10.1007/s10544-023-00665-z https://doi.org/10.1063/5.0066619 Ormocer: http://dx.doi.org/10.1680/jbibn.21.00042
	5.2	Supply of various printing materials with different chemical-physical properties (ml)	75		SI	OK, con dettaglio
	5.3	Possibility of using biocompatible materials with low cito-toxicity (cell viability >80%)			SI	A lot of Nanoscribe's resins are tested as biocompatible e.g. according to ISO 10993-5 (see above) with low cito-toxicity either by external test institutes or in publications of our customers like: IP-S: https://doi.org/10.1002/adem.201901358 "the IP-S resin can be considered not toxic in these experiments even after 48 h of direct contact exposure".
Accessories and add-ons	6.1	Number of objectives (with accessories and printing parameters) of different magnifications for printing at high, low, and two intermediate resolutions	4		SI	4 objectives are included.
	6.2	Supply of a PC/laptop to manage the design files and control the system			SI	Quantum X comes with a fully integrated PC, which allows for full processing, execution of the printing process and control of the system
Delivery, installation, commissioning, and acceptance	7.1	Time for the supply, including delivery, installation, commissioning, and acceptance test (months)		7	SI	7 mesi
Training	8.1	Training days onsite at installation for at least five users for the good and efficient use of the system (days, where one day is 8 working hours)	3		SI	Confermano 3 gg
Service and maintenance	9.1	Working days within which to receive onsite assistance (days)			SI	Please note that our standard onsite time is 1 month. Extra for you, we add our Service Contract "Fundamental Plus" to ensure the mentioned 14 days.
	9.2	Hours within which to receive remote technical assistance on-call (hours)			SI	This includes as well a response time for a "remote inspection within 24 hours after initial report of an issue"
	9.3	Duration (months)	36		SI	We include these service contracts for the mentioned 36 months
Warranty	10.1	Warranty duration, comprising a substitution of failed and/ or malfunctioning components (months)	12		SI	The first 12 months include our Service Contract "Platinum" with full machine warranty which covers all spare parts and repair costs in case of system failure. Afterwards, we added our Service Contract "Fundamental" for the next 2 years
Terms and conditions of supply	11.1	The supply must include all accessories and materials necessary for full operation of the equipment covered by this tender at the installation site			SI	All necessary accessories to operate the equipment are included like e.g.. Accessories - Substrate holders for standardized glass and silicon substrates* o Wafers with 2" diameter and 0.5 mm thickness, with primary flat o Rectangular substrates, size 76 x 26 x 1 mm³ - Calibration Standard - Processing accessories set including glassware, photoresin cartridge holder, utilities for preparation as well as post-processing, and substrates - Printed and digital user manual - Country-specific power cable and pressured air adaptors Please note, that we would expect, that cleaning materials like IPA or Acetone or washing bath materials like PGMEA are available onsite.

	11.2	The supply must include spare parts (e.g., filters) for routine maintenance of the instrument for at least 3 years			SI	Typical routine maintenance means switching on and off of the system and cleaning the objective. For these operations, no spare parts will be needed. Regarding filters We recommend to change 2 filters in the bioprinting chamber every 6 months. Thus: 6 filters each will be included to the delivery.

UpNano GmbH						
Elements		**Essential requirements**	**Min. value**	**Max. value**	**VERIFICA COMMISSIONE (SI/NO)**	**NOTE**
2-photon lithography 3D printer	1.1	2-photon lithography system able to 3D print objects such as: •cellular constructs •micro-optics, micromechanics, or microfluidics components			SI	OK
	1.2	Printing area (mm2)	50x50	-	SI	Maximum printing area of 120 x 100 mm
	1.3	Printing height (mm)	20		SI	40 mm
	1.4	Femtosecond laser source, with emission wavelength between (nm):	700	800	SI	780 nm
	1.5	3D bioprinting module for printing cellular constructs in a sterile and controlled environment (temperature and humidity) to ensure cells viability			SI	It has a bioprinting module, commercial name BioUnit, which can be used to print cellular constructs in a sterile and controlled environment. The BioUnit supplies the printing chamber with CO 2 , humidity, and temperature (specifications in UpNano_Brochure_NanoOne page 17)
	1.6	Usage under standard laboratory conditions, without needing a clean room			SI	The N1B can be used under stand ard laboratory conditions natural white light, 21 ± 2°C) without the need for a clean room. Our proprietary resins do not polymerize under normal light conditions (white light, sunlight). The N1B is equipped with a HEPA Filter, which establishes clean room ISO class 6 conditions inside of the printing chamber. The system is additionally equipped with an internal vibration isolation system that doesn't need compresses air supply.
High-resolution 3D printing (magnification 40x or higher)	2.1	Scan / writing speed (mm/s)	100		SI	The NanoOne can print with a 40x objective with a typical scan/writing speed of 150 mm/s and 100 mm/s with a 60x objective. [T1, 2.1]
	2.2	Horizontal feature size in the xy plane (µm)		0.25	SI	Frontal views of the surface features of face 1 are provided in the following images. Fig. 3 shows the feature size in xy direction of 227 nm. [T1, 2.2]
	2.3	Vertical feature size along the z-axis (µm)		0.6	SI	Frontal views of the surface features of face 1 are provided in the following images. Fig. 5 shows the feature size in z direction of 367 nm. [T1, 2.3]
Low-resolution 3D printing (magnification 5x or lower)	3.1	Scan / writing speed (mm/s)	1000		SI	For a 5x objective the typical scan/writing speed is 1200 mm/s. [T1, 3.1]
	3.2	Horizontal feature size in the xy plane (µm)		2	SI	The requested minimal feature size of 2µm or less was demonstrated by printing singular lines in a grid formation. The grid was produced by printing with a Fluar 5x 0.25A objective in UpPhoto, with a line spacing (Δ xy) of 20µm. [T1, 3.2], [T2, 3.2]
	3.3	Vertical feature size along the z-axis (µm)		50	SI	The requested minimal feature size along the Z axis of 50µm or smaller could be demonstrated with the pillars printed on face 3. The z height of them is 47 µm. [T1, 3.3], [T2, 3.3]
Software interface	4.1	Graphical interface for the definition of geometries and printing parameters			SI	Our proprietary data preparation software, Think3D, offers a graphical interface for the definition of geometries and printing parameters
	4.2	Compatibility with 3D CAD files from third-party software			SI	The compatibility with 3D CAD files from third-party software is handled through Think3D by the data format STL.
	4.3	Set of predefined parameters for best printing according to material and resolution included			SI	For every objective and standard material, a set of predefined parameters can be selected in the software for the best printing results. These custom parameters can also be changed and stored for next time usage
	4.4	3D preview of the printing process, with process duration estimation			SI	Think3D offers a preview of the printing process where the stitching lines can be seen and moved if a stitching line goes through a critical element. The software can also estimate the print time duration
Printing materials	5.1	Possibility to use non-proprietary commercial materials (including generic light-curable materials, such as SU-8 – albeit optimal printing resolution cannot be guaranteed)			SI	It is also possible to use it to cure widely known materials such as SU-8 and AZ resists

Printing materials	5.2	Supply of various printing materials with different chemical-physical properties (ml)	75		SI	UpNano offers as of now 8 proprietary printing materials, each with different chemical and physical properties
	5.3	Possibility of using biocompatible materials with low cito-toxicity (cell viability >80%)			SI	Il our materials, except for UpBrix, show very high biocompatibility and low cytotoxicity. Especially UpPhoto, which was used to produce microfluidic devices for culturing cells inside
Accessories and add-ons	6.1	Number of objectives (with accessories and printing parameters) of different magnifications for printing at high, low, and two intermediate resolutions	4		SI	The N1B will be supplied with six objectives for printing at different magnifications. One 60x and one 40x objective for high resolution printing, three objectives for printing at intermediate resolutions (20x, 10x NA 0.3 and 10x NA 0.4) and one 5x objective for low resolution printing. [T1, 6.1], [T2] The 10x NA 0.3 objective is selected for printing higher structures inside of well plates and microfluidic chips due to its extended working distance.
	6.2	Supply of a PC/laptop to manage the design files and control the system			SI	An operator PC with a touchscreen monitor will be supplied with the purchase to manage the design files, control the system, and control the printing processes. This PC can be, but does not have to, be placed directly next to the machine.
Delivery, installation, commissioning, and acceptance	7.1	Time for the supply, including delivery, installation, commissioning, and acceptance test (months)		7	SI	6 mesi
Training	8.1	Training days onsite at installation for at least five users for the good and efficient use of the system (days, where one day is 8 working hours)	3		SI	4 gg
Service and maintenance	9.1	Working days within which to receive onsite assistance (days)			SI	10
	9.2	Hours within which to receive remote technical assistance on-call (hours)			SI	OK
	9.3	Duration (months)	36		SI	48 mesi
Warranty	10.1	Warranty duration, comprising a substitution of failed and/ or malfunctioning components (months).	12		SI	12+12
Terms and conditions of supply	11.1	The supply must include all accessories and materials necessary for full operation of the equipment covered by this tender at the installation site			SI	OK
	11.2	The supply must include spare parts (e.g., filters) for routine maintenance of the instrument for at least 3 years			SI	Anche HEPA