

ANNEX 1 - Price book for COMMERCIAL PROJECTS At DTU Nanolab Effective: January 1st - 2023

Main changes compared to last year's price book

- Major revision of the price book
- New prices for tool categories, assistance, area rent and materials
- Tool list updated

1 Table of Contents

1	Table of Contents.....	1
2	General information.....	2
3	Specific materials priced at cost	3
4	Equipment capabilities and charging categories	4
4.1	Lithography tools	4
4.2	Thin Film tools.....	5
4.3	Etch tools.....	6
4.4	Wafer cleaning tools	7
4.5	Thermal process tools.....	8
4.6	SEM/TEM Preparation and Characterization Tools (located in building 307/314).....	9
4.7	Backend tools.....	10
4.8	Cleanroom characterization tools.....	10
4.9	E-beam writer & DUV stepper tools	12
5	Tool changes	13
5.1	Scheduled routine changes.....	13

2 General information



All prices are in Danish kroner without moms. All prices are subject to change.

Service from Nanolab	Unit	Commercial activity
Cleanroom access (below cap) ^{2,3,4}	Kr/hour	1200
Category A tools	Kr/hour	450
Category B tools	Kr/hour	890
Category C tools	Kr/hour	3900
Category D tools	Kr/hour	1500
Category E tools	Kr/hour	2150
Category P tools	Kr/hour	450
Nanolab assistance	Kr/hour	1800
Area rent	Kr/m ² /month	2370
Materials		At cost+20%

Note 1, DTU management have decided to support all internal projects. They are paid for as long as the department meets its required external funding for DTU Nanolab activities

Note 2, the cap is calculated per individual and is at 20 hours per month, usage above the cap is charged as 0 kr/h.

Note 3, a maximum of 6 hours is registered per swipe. If a person forgets to swipe out, no more than 6 hours will be charged.

Note 4, Category F tools are included in the cost of cleanroom access

Service	Value	Details
Maskorder "Review" and help ordering	time used	DTU Nanolab assistance
Introductory package training	1.5 hour	DTU Nanolab assistance
Tool Package Trainings (TPT)	2 hour	DTU Nanolab assistance
Shelves for work in progress	1 m ²	Area rent – note 5,6
Floor space in cleanroom and subfab/basement (mix of white and grey space)	1 m ²	Area rent – note 6
Locker	0,25 m ²	Area rent – note 6
Shelf in chemical cabinet in basement	0,5 m ²	Area rent – note 6
Storage shelf in basement	0,25 m ²	Area rent – note 6
Issuing a guest-card when user has forgotten own card	0.5 hour	DTU Nanolab assistance

Note 5, The area of a shelf rack is calculated as the floor area covered by the rack and 110 cm access in front. For a single shelf divide this by 5 (approximate average number of shelves in a rack) to get the value.

Note 6, Limited amount of this item, subject to availability, minimum period is 6 months

3 Specific materials priced at cost



Note! These materials will be charged at the cost prices + 20%.

Precious metal costs	Cost Price	Details
Gold	4.50	kr/nm
Platinum	3.81	kr/nm
Palladium	3.71	kr/nm

The cost for precious metal is for every nanometer deposited regardless of whether it is on the sample or shutter.

Photoresists	Cost Price	Details
DUV42S-6	4.67	kr/g
KRF M35G	2.31	kr/g
KRF M230Y	2.16	kr/g

The mass of resist is measured by internal scales in the Gamma tools.

ALD sources	Cost Price	Details
TMA	4.60	kr/s
DEZ	12.08	kr/s
TiCl	1.72	kr/s
TEMAHf	0.23	kr/s

The time is measured as the total time open to a given source during a deposition. So for instance if the TMA pulse time in a given run is 0.1 s and a total of 500 pulses are used, that equates to 50 s of TMA source for that run.

4 Equipment capabilities and charging categories



At DTU Nanolab we have equipment that supports most nanofabrication and -characterization techniques. In the following we present our current portfolio of tools and the associated charging category. We have the tools divided up into nine groups depending on their processing capability. We have also added a subgroup to better indicate the specific purpose of the tool.

Most tools are located in our Cleanroom building 346 except for the nano-preparation and -characterization tools in section 4.6 which is located in building 307 or 314.

Tools in category R are not for general use. They are owned by a research group or a company. If you are interested in one of these tools please contact Fabrication Support (sales@nanolab.dtu.dk) and we can facilitate a contact.

Some tools are charged based on the booked time they are indicated with "Yes" in the column "By booking"; otherwise charging is based on logged time.

4.1 Lithography tools

We use lithography as a means to add or remove material in specific areas to create a pattern on a surface. DTU Nanolab supports several types of lithography spanning linewidth resolutions from around 10 nm and up.

The most common way of lithography is by using light to expose a sensitive film (resist) that were spun on a wafer/sample to obtain a thin uniform film. The pattern is revealed by placing the sample with the film in a developer. The developer is in this case typically a chemical etching solution consisting of a base and water.

Our standard tools for lithography uses UV light with a wavelength of 365 nm to 410 nm and you can typically achieve a line resolution of around 1-2 μm . Exposure can be done using our mask aligner where the light passes a glass mask with the pattern defined in a chromium pattern or using our Mask Less Aligners (MLA) where the pattern only exists as a data file and the pattern is made during exposure using an advanced electro-optical system.

To obtain a better resolution please find more information in section 4.9.

Find more information about lithography in our LabAdviser using this link

[https://labadviser.nanolab.dtu.dk/index.php?title=Specific Process Knowledge/Lithography](https://labadviser.nanolab.dtu.dk/index.php?title=Specific%20Process%20Knowledge/Lithography)

Name	LM nr	Category	sub group
2PP printer	1.038	R	
Aligner: MA6 - 2	1.053	A	Aligner
Aligner: Maskless 01 (MLA1)	1.075	A	Aligner
Aligner: Maskless 02 (MLA2)	1.078	A	Aligner
Aligner: Maskless 03 (MLA3)	1.081	A	Aligner
Beamer PC - external	1.093	F	PC
Developer: SU8	1.024	F	Developer
Developer: SU8 (Wet Bench)	1.092	F	Developer
Developer: TMAH Manual	1.049	A	Developer
Developer: TMAH UV-lithography	1.050	A	Developer
Fume hood 09: UV development	1.067	F	Developer
Fume hood 10: e-beam development	1.068	F	Developer
Fume hood 11: Lithography cleaning	1.074	F	

Name	LM nr	Category	sub group
Hotplate 1 (SU8)	1.014	F	hotplate
Hotplate 2 (SU8)	1.015	F	hotplate
Hotplate 3 (SU8)	1.079	F	hotplate
Hotplate: 90-110C	1.052	F	hotplate
Imprinter 01	1.065	A	Imprinter
Imprinter 02	1.066	A	Imprinter
Inclined UV-lamp	1.037	A	Exposure
Lift-off	1.060	A	
Micro Transfer Printer	1.090	A	
MVD	1.030	A	
Oven 250C	1.018	F	Oven
Oven 250C for burned resist	1.019	F	Oven
Oven 90C	1.016	F	Oven
Oven: 110 - 250C	1.017	F	Oven
Oven: HMDS - 2	1.054	F	Oven
Plasma Asher 1	1.005	F	Plasma asher
Plasma Asher 2	1.031	F	Plasma asher
Plasma Asher 3: Descum	7.021	A	
Program oven	1.020	F	Oven
Resist strip	1.061	F	
Spin Coater: Gamma e-beam & UV	1.071	A	Resist coater
Spin Coater: Gamma UV	1.055	A	Resist coater
Spin Coater: Labspin 02	1.057	A	Resist coater
Spin Coater: LabSpin 03	1.063	A	Resist coater
Spin Coater: RCD8	1.056	A	Resist coater
Spin coater: Süss Stepper	1.041	A	Resist coater
Spray Coater	1.042	A	Resist coater
Wafer Bonder 02	1.058	B	Wafer bonder
Wafer Bonder 03	1.077	A	Wafer bonder
Wet bench 06: Resist strip	1.069	F	
Wet bench 07: Lift-off	1.070	F	
Wet bench 08: Spinner	1.072	F	
Wet bench 09: Spinner	1.073	F	

4.2 Thin Film tools

There are many different methods to create thin films on samples. In this context we generally think of films having a layer thickness from one atomic layer up to a few micrometers and in rare cases up to 0.5 mm (for the electroplating tools).

The different techniques are usually named using an abbreviation like PVD (Physical Vapor Deposition), LPCVD (Low Pressure Chemical Vapor Deposition), PECVD (Plasma Enhanced Chemical Vapor Deposition) and ALD (Atomic Layer Deposition) and each has their pros and cons.

Find more information about deposition tools and techniques in LabAdvisor using this link

https://labadvisor.nanolab.dtu.dk/index.php?title=Specific_Process_Knowledge/Thin_film_deposition

Name	LM nr	Category	sub group	Pay by booking
ALD 1	2.021	B	ALD	
ALD 2 (PEALD)	2.023	B	ALD	
Diamond CVD 01	2.025	R	PECVD	
E-Beam Evaporator (10-pockets)	2.035	B	PVD; evaporation	
E-Beam Evaporator (Temescal)	2.029	B	PVD; evaporation	
Electroplating-Cu	2.022	A	Plating	
Electroplating-Ni	2.017	A	Plating	Yes
Furnace: LPCVD Nitride (4) (B2)	2.012	B	LPCVD	
Furnace: LPCVD Nitride (6) (E3)	2.015	B	LPCVD	
Furnace: LPCVD Poly-Si (4) (B4)	2.010	B	LPCVD	
Furnace: LPCVD Poly-Si (6) (E2)	2.019	B	LPCVD	
Furnace: LPCVD TEOS (B3)	2.011	B	LPCVD	
PECVD3	2.009	B	PECVD	
PECVD4	2.024	B	PECVD	
Proline 200	2.032	B	PVD; Sputtering	
Sputter coater 03	2.026	B	PVD; Sputtering	
Sputter Coater 04	2.028	F	PVD; Sputtering	
Sputter-System Metal-Nitride(PC3)	2.031	B	PVD; Sputtering	
Sputter-System Metal-Oxide(PC1)	2.030	B	PVD; Sputtering	
Sputter-System(Lesker)	2.014	B	PVD; Sputtering	
Thermal Evaporator	2.027	B	PVD; evaporator	
Wordentec	2.013	B	PVD; evaporator	

4.3 Etch tools

Etching is a common way to remove material. We provide both wet and dry etching techniques. Wet etching is typically done using either a base or an acid to remove a selected material. One good thing about wet etching is that you can get a good selectivity so that only the material you want to remove is actually removed. However, wet etching is in most cases also isotropic meaning that the removal rate is the same in all directions. If you etch through a hole on a surface you will get under etching and sloped (rounded) walls. We provide both specialized wet stations for commonly used etchants and fume hoods for safe handling and etching in beakers.

Dry etching usually involves a vacuum chamber supplied with selected gasses and a plasma to make these gasses reactive. It is controlled and monitored using a computer. This gives a very good control of the process which you can vary from being very “wet etch” like to be more “physical” using bombardment of the surface with ions and radicals to remove material. You have better directionality with no under etching the more “physical” the process is. At the same time you will, however, lose selectivity.

Find more information about wet and dry etching tools and techniques in LabAdvisor using this link https://labadviser.nanolab.dtu.dk/index.php?title=Specific_Process_Knowledge/Etch

Name	LM nr	Category	sub group
Aluminium Etch	3.041	F	Wet etch

Name	LM nr	Category	sub group
AOE	3.001	B	Dry etch
ASE	3.002	B	Dry etch
Critical Point Dryer	3.025	A	
DRIE-Pegasus	3.027	B	Dry etch
DRIE-Pegasus 2	3.044	B	Dry etch
DRIE-Pegasus 3	3.051	B	Dry etch
DRIE-Pegasus 4	3.052	B	Dry etch
Fume hood 01: Acids/bases	3.031	F	Wet etch
Fume hood 02: Acids/bases	3.032	F	Wet etch
Fume hood 05: Special purpose & nanoparticles	3.033	F	
Fume hood 06: Si etch	3.034	F	Wet etch
Fume hood 07: III-V acids/bases	3.035	F	Wet etch
Fume Hood 12 (Standard clean)	3.057	F	Wet etch
Fume Hood(RCA)	3.016	F	Wet etch
Fume Hood(Service Area)	3.017	F	Wet etch
Fumehood(Bases)	3.021	F	Wet etch
Fumehood(Manual Spinner)	3.020	F	Wet etch
HF Clean (Fume hood (RCA))	3.026	F	Wet etch
HF Vapour Phase Etcher 01	3.053	B	Wet etch
IBE/IBSD Ionfab 300	3.029	B	Dry etch
ICP Metal Etch	3.028	B	Dry etch
III-V ICP	3.055	B	Dry etch
III-V RIE	3.056	B	Dry etch
Nitride etch: H3PO4	3.037	A	Wet etch
Oxide etch 1: BHF	3.042	F	Wet etch
Oxide etch 2: BHF (clean w. wetting agent)	3.038	F	Wet etch
Oxide etch 3: BHF (wetting agent)	3.040	F	Wet etch
PCB Etch	3.030	R	
Poly Si etch	3.039	F	Wet etch
Si Etch 1: KOH	3.036	A	Wet etch
Si Etch 2: KOH	3.043	A	Wet etch
Si Etch 3: KOH	3.045	A	Wet etch
Wet bench 01: Si etch	3.046	F	Wet etch
Wet bench 02: Nitride etch	3.047	F	Wet etch
Wet bench 04: Oxide & poly etch	3.048	F	Wet etch
Wet bench 05: Al etch	3.049	F	Wet etch
Work space in Fume Hood 06	3.050	F	Wet etch

4.4 Wafer cleaning tools

In our processing it is very important to keep all surfaces clean of any contaminants due to the very fine patterns and the use of very different materials and chemicals. We therefore provides a range of tools and chemical benches/fume hoods to clean wafers and samples.

Find more information about wafer cleaning techniques in LabAdviser using this link
https://labadviser.nanolab.dtu.dk/index.php?title=Specific_Process_Knowledge/Wafer_cleaning

Name	LM nr	Category	sub group
Box washer	4.018	F	Wet clean
Buffered HF-Predep	4.016	F	Wet clean
Cleaning bench	4.022	F	Wet clean
Fume hood 03: Solvents	4.026	F	Wet clean
Fume hood 04: Solvents	4.027	F	Wet clean
Fume hood 08: III-V solvents	4.028	F	Wet clean
Fumehood(Cleaning)	4.023	F	Wet clean
Fumehood(Solvent 11)	4.024	F	Wet clean
Fumehood(Solvent 12)	4.025	F	Wet clean
HF 5% - RCA	4.015	F	Wet clean
Mask Cleaning	4.029	F	Wet clean
Post CMP cleaner	4.034	A	Wet clean
RCA (4,6)	4.014	F	Wet clean
RCA spin dryer	4.020	A	Drying
Spin dryer 1	4.004	F	Drying
Spin dryer 2	4.005	F	Drying
Spin dryer 3	4.013	F	Drying
Spindryer 5 (4,6)	4.032	F	Drying
Stepper Spin Dryer	4.021	A	Drying
Wafer Cleaning	4.030	F	Wet clean
Wet bench 03: Wafer and mask cleaning	4.033	F	Wet clean

4.5 Thermal process tools

One of the basic processes in Silicon microfabrication is the ability to form a very good insulating layer on top of the semiconductor. This is done in a thermal process where you subject the silicon wafer to moisture or dry oxygen at a high temperature around 1000°C. This oxidizes the surface and creates a silicon dioxide layer out of the topmost silicon atoms. This is an extremely well controlled process and creates SiO₂ of high optical, chemical and physical quality. By patterning the surface and etching the SiO₂ you can also use the remaining SiO₂ layer as a barrier to control diffusion of selected impurity atoms to create n- and p-type Silicon. Our range of furnaces supports both this process but also other processes for wafer bonding and thermal treatment of samples.

Find more information about oxidation and thermal treatment tools in LabAdviser using this link https://labadviser.nanolab.dtu.dk/index.php?title=Specific_Process_Knowledge/Thermal_Process

Name	LM nr	Category	sub group
BCB Curing Oven	5.015	A	Annealing
Furnace: Al-Anneal (C4)	5.005	A	Annealing
Furnace: Anneal-bond (C3)	5.008	A	Annealing
Furnace: Anneal-oxide (C1)	5.006	A	Annealing
Furnace: Boron Drive-in and Pre-dep (A1)	5.004	A	Oxidation
Furnace: Gate Oxide (A2)	5.003	A	Oxidation
Furnace: III-V Oxidation (C2)	5.007	F	Oxidation

Furnace: Multipurpose annealing	5.016	B	Annealing
Furnace: Oxidation (8) (E1)	5.019	A	Oxidation
Furnace: Phosphorus Drive-in (A3)	5.002	A	Oxidation
Furnace: Phosphorus Predep (A4)	5.001	A	Oxidation
RTP Jipelec	5.013	A	Annealing
RTP Smoothing	5.017	R	Annealing
RTP2 Jipelec	5.018	A	Annealing

4.6 SEM/TEM Preparation and Characterization Tools (located in building 307/314)

DTU Nanolab has a long tradition of research and development of Scanning- and Transmission Electron Microscopy (SEM and TEM) using advanced detectors and in-situ measurements techniques. Currently we are also expanding our capabilities to prepare soft matter tissues and samples.

Find more information about our SEM/TEM preparation and characterization tools in LabAdviser using this link

<https://labadviser.nanolab.dtu.dk/index.php?title=LabAdviser/314>

Name	LM nr	Category	sub group	Pay by booking
AFEG 250 Analytical ESEM	6.018	D	SEM	Yes
Axon	6.037	R		
Carbon Coater	6.014	P	prep	
Cryo Holder ST	6.021	P	prep	
DENSolutions Climate	6.036	R	TEM	
EM CPD300 Critical Point Dryer	6.024	P	prep	
EM GP2 Plunge freezer	6.019	P	prep	
EM UC7/FC7 Ultramicrotome	6.023	P	prep	
Fishione Ion Milling	6.033	P	prep	
FlatQUAD detector	6.040	E	SEM	
Helios NanoLAB 600	6.005	E	SEM	Yes
Hydra PFIB	6.039	E	SEM	Yes
Minitom Saw	6.028	P	prep	
Nano Mill	6.000	P	prep	Yes
Nova NanoSEM 600	6.011	E	SEM	Yes
Olympus BX51	6.022	P		
Olympus BX51 stage	6.025	P		
Pumping cube	6.001	P		
QEMSCAN	6.017	R	SEM	
QFEG 200 Cryo ESEM	6.003	D	SEM	Yes
Quorum Coater	6.013	P	prep	
Remote Access Laptop 1	6.035	R		
RMC MT-7 Microtome	6.034	P	prep	
Spectra Ultra - note 7	6.042	E	TEM	Yes
Struers LaboPol-25	6.029	P	prep	
Struers LaboPol-4	6.031	P	prep	
Struers LaboPol-5	6.026	P	prep	

TechPrep	6.027	P	prep	
Tecnai T12 BioTwin	6.015	D	TEM	Yes
Tecnai T20 G2	6.006	D	TEM	
Titan Analytical 80-300ST - note 8	6.007	E	TEM	Yes
Titan E-Cell 80-300ST	6.008	E	TEM	Yes
Video Kit CEN	6.016	R		
Well wire saw	6.030	P	prep	

Note 7, the new Spectra Ultra TEM is expected to be available in Q3 2023.

Note 8, the Titan ATEM will be unavailable from around 1 February 2023 due to the installation of our new advanced TEM.

4.7 Backend tools

We have a number of tools dedicated to separating wafers into chips, packaging of these or other kind of treatment. These tools are typically located outside of the Cleanroom and used as the last step of the process.

Find more information about our Backend processing tools in LabAdvisor using this link

https://labadviser.nanolab.dtu.dk/index.php?title=Specific_Process_Knowledge/Back-end_processing

Name	LM nr	Category	sub group
0-TestTool	7.019	F	
3D Printer	7.020	R	
Ball wire-bonder	7.012	A	Packaging
Cleaver: Flex Scribe	7.029	F	Dicing
Cleaver: Flip Scribe	7.028	F	Dicing
Cleaver: Lattice Axe	7.027	F	Dicing
Dicing Saw DAD321 (old)	7.006	A	Dicing
Dicing saw DAD3241	7.030	A	Dicing
Die-bonder	7.011	A	Packaging
Hot embosser 1	7.025	R	
Laser Micromachining Tool	7.013	A	
Polisher/CMP	7.024	A	
Polisher/Lapper	7.010	A	
Polymer dryer 1	7.022	F	
Polymer dryer 2	7.023	F	
Polymer Injection Molding	7.008	A	
Stylus profiler: Dektak 150	7.026	F	
TPT Wire Bonder	7.007	A	Packaging
Vacuum sealer	7.016	F	Packaging
Video Kit NLAB South	7.001	R	
Wafer Cleaner Disco DCS1441	7.031	F	Dicing

4.8 Cleanroom characterization tools

In order to verify that you are processing what you intend to fabricate you need inline inspection and characterization equipment. Our Cleanroom is equipped with all standard nanotechnology inspection tools. We also have a range of duplicated or other tools placed outside the Cleanroom (many in the basement of building 346) for further inspection of fabricated devices.

Find more information about our Cleanroom Characterization tools in LabAdviser using this link
https://labadviser.nanolab.dtu.dk/index.php?title=Specific_Process_Knowledge/Characterization

Name	LM nr	Category	sub group
AFM Icon-PT 1	8.048	A	Profiling
AFM Icon-PT 2	8.058	A	Profiling
CV-profiler	8.042	F	Profiling
Dektak 3ST stylus profiler	8.070	F	Profiling
DektakXTA	8.040	F	Profiling
Drop Shape Analyzer	8.023	F	
Ellipsometer M-2000V	8.024	F	Optical
Ellipsometer VASE	8.045	F	Optical
F10-RT reflectometer	8.063	F	Optical
Filmtek	8.018	F	Optical
Four Point Probe	8.014	F	Electrical
Four point probe - Jandel	8.060	F	Electrical
Hardness tester	8.057	F	
IR-Camera	8.010	F	Optical
KLA Tencor SurfScan 6420	8.046	A	Profiling
Leica INM 100 (yellow filter)	8.033	F	Optical
Leica S8 APO	8.030	F	Optical
Leitz Medilux	8.032	F	Optical
Lifetime scanner MDPmap	8.049	F	Electrical
Microscope: Nikon ECLIPSE L200 2	8.044	F	Optical
Microscope: Nikon ECLIPSE L200N 3	8.053	F	Optical
Microscope: Nikon ECLIPSE L200N 4	8.054	F	Optical
Microscope: Zeiss Axiotron 2	8.043	F	Optical
Microscope: Zeiss Jenatech (particle meas.)	8.034	F	Optical
MicroSpectroPhotometer (Craic 20/30 PV)	8.066	A	Optical
NanoprobeSystem_miBots	8.069	F	Electrical
Nikon ECLIPSE L200	8.025	F	Optical
Nikon ME 600	8.037	F	Optical
Noco IR microscope	8.035	F	Optical
Optical Microscope 11	8.041	P	Optical
Optical Profiler (Filmetrics)	8.064	A	Optical
Optical Profiler (Sensofar S Neox)	8.068	F	Optical
PL-mapper	8.071	A	Optical
Probe station 3 - EPS150Triax	8.051	F	Electrical
SEM Gemini 1	8.072	D	SEM
SEM Supra 1	8.026	D	SEM
SEM Supra 2	8.047	D	SEM
SEM Supra 3	8.052	D	SEM
SEM Tabletop 1	8.055	A	SEM
Stylus Profiler (Tencor P17)	8.067	F	Profiling
Thickness measurer	8.021	F	
Thickness measurer (Wafers)	8.059	F	

Name	LM nr	Category	sub group
XPS K-Alpha	8.027	A	
XPS Nexsa	8.062	A	
XRD Powder	8.061	A	
XRD SmartLab	8.056	A	
Zeiss Jenatech (strain)	8.028	F	Optical

4.9 E-beam writer & DUV stepper tools

To achieve patterns with a resolution of better than 1 μm you can use our DUV stepper. Here the pattern is again defined in a glass mask with a chromium layer and the exposure is done using DUV light with a wavelength of 248 nm and an optical system that reduces the pattern on the mask with a factor of 5. In this way a resolution of around 200 nm is possible and since the machine has automatic wafer loading a high throughput of wafers can be achieved.

The finest patterns are obtained using e-beam lithography where a beam of electrons exposes an electron sensitive resist followed by development in a solvent. In this way a resolution of down to 10 nm is possible.

Find more information about our e-beam writer and DUV Stepper tools in LabAdviser using these links

https://labadviser.nanolab.dtu.dk/index.php?title=Specific_Process_Knowledge/Lithography/EBeamLithography

https://labadviser.nanolab.dtu.dk/index.php?title=Specific_Process_Knowledge/Lithography/DUVStepperLithography

Name	LM nr	Category	sub group
Developer: E-beam	9.008	A	Developer
Developer: TMAH Stepper	9.007	A	Developer
DUV Stepper	9.003	C	Exposure
E-Beam Writer 9500	9.004	C	Exposure
Fume Hood (Stepper)	9.005	F	
Prealigner 02	9.009	F	
Raith e-LINE	9.010	D	Exposure

5 Tool changes

A vast number of DTU Nanolab's tools can operate with different substrate sizes, chucks, materials or similarly. The consequences of various changes are described in the following sections. Regarding pricing, all scheduled changes are included in the tool cost but all non-scheduled changes result in a specific charge.

5.1 Scheduled routine changes

Some tools are changed on a weekly basis. To request a change a mail must be send to a "Change responsible", who is in charge of the change plan for the tool. The change responsible will return by email to acknowledge the request and inform about when the request can be met. When we have made the change to the tool, we update the status log in LabManager.

Scheduled routinely changed tools	LM ID	Routine change	Cost (DTU Nanolab assistance)	Change responsible e-mail
Temescal	2.029	Metals	2 hours	metal@nanolab.dtu.dk
Wordentec	2.013	Metals	2 hours	metal@nanolab.dtu.dk
Sputter-System Metal-Oxide	2.030	Materials	2 hours	metal@nanolab.dtu.dk
Sputter-System Metal-Nitride	2.031	Materials	2 hours	metal@nanolab.dtu.dk
Sputter System (Lesker)	2.014	Materials	2 hours	metal@nanolab.dtu.dk
Polymer Injection Molding	7.008	Tool	1 hour	toolchange@nanolab.dtu.dk
Dicer DAD321	7.006	Dicing blade	1 hour	CustomerSupport@nanolab.dtu.dk
Dicer DAD3241	7.030	Dicing blade	1 hour	CustomerSupport@nanolab.dtu.dk