NUS National University of Singapore | College of Design and Engineering

E6NanoFab

Price List

Equipment	Lab Type	Process Type	Consumables Fees Apply	UOM	NUS (PPU)	Public* (PPU)	Engineering Service*	Training Fees*
Rapid Thermal Process - Annealsys	Cleanroom	Annealing Process (Diffusion)		hr	150	250	NA	100
Horizontal Furnace - Ultech	Cleanroom	Annealing Process (Oxidation)	8 Hours per Run	run	1500	1900	NA	1000
Rapid Thermal Process 1 - MILA3000	Cleanroom	Annealing Process (Diffusion)		hr	80	135	Upon REQ	100
Rapid Thermal Process 2 - MILA3000	Cleanroom	Annealing Process (Diffusion)		hr	80	135	Upon REQ	100
E-Beam Evaporator - AJA UHV	Cleanroom	Deposition & Growth	Au, Pt, Ra and AG	hr	110	170	Upon REQ	150
E-Beam Evaporator - Edward (L2DL)	Dry Lab	Deposition & Growth		hr	100	160	Upon REQ	150
Thermal Evaporator - Edward (L2DL)	Dry Lab	Deposition & Growth		hr	100	160	Upon REQ	150
Sputtering System - AJA (No gold & copper)	Cleanroom	Deposition & Growth		hr	100	170	Upon REQ	200
Sputtering System - AJA UHV	Cleanroom	Deposition & Growth		hr	140	235	Upon REQ	200
Hotplate (L2CR)	Cleanroom	Deposition & Growth		hr	15	25	NA	10
Photoresist Spinner (L2CR)	Cleanroom	Deposition & Growth	Special photoresist	hr	15	25	NA	30
ALD Thermal (Dielectric) - Picosun	Cleanroom	Deposition & Growth		hr	190	320	Upon REQ	250
ALD Plasma (Nitride) - Picosun	Cleanroom	Deposition & Growth		hr	190	320	Upon REQ	250
PECVD - Oxford PlasmaPro 100	Cleanroom	Deposition & Growth		hr	150	250	Upon REQ	150
MBE (II-VI / IV Materials Growth) - ULVAC	Dry Lab	Deposition & Growth		hr	1000	1350	Upon REQ	1250
XeF2 Vapor Etcher	Wet Lab	Etching	Gas	hr	100	170	Upon REQ	100
Chemical Mechanical Planerization (CMP) - Logite	Cleanroom	Etching	Slurry and Pad	hr	100	170	NA	100
CMP SF1 Slurry	Cleanroom	Etching		ea	65	80	NA	NA
CMP Pad	Cleanroom	Etching		ea	NA	NA	NA	NA
CMP Template	Cleanroom	Etching		ea	NA	NA	NA	NA
CMP Adehesive	Cleanroom	Etching		ea	NA	NA	NA	NA
Plasma Asher - Samco	Cleanroom	Etching		hr	100	170	400	100
Plasma Cleaner - Vita	Cleanroom	Etching		hr	100	170	400	100
ICP RIE and ALE (CH1 Metal Etch) - Oxford	Cleanroom	Etching		hr	125	210	NA	200
ICP RIE and ALE (CH3 Compound) - Oxford	Cleanroom	Etching		hr	125	210	NA	200
ICP RIE and ALE (CH2 Dielectric) - Oxford	Cleanroom	Etching		hr	125	210	NA	200
Acid Wet Bench - Class 1000 (6" capability)	Cleanroom	Etching	Special chemcial	per day	25	30	NA	30
Solvent Wet Bench - Class 1000	Cleanroom	Etching	Special chemcial	per day	25	30	NA	30
4 Point Probe Station	Cleanroom	Electrical Test		hr	35	55	Upon REQ	50
Probe Station with Semiconductor Analyser	Dry Lab	Electrical Test		hr	30	40	NA	50
Electron Beam Lithography - Ellionix	Cleanroom	Lithography		hr	200	250	Upon REQ	300
Electron Beam Lithography - Raith	Cleanroom	Lithography		hr	250	300	Upon REQ	900
Mask Aligner - MA8 (Top-line, Bottom-line & IR Alignment)	Cleanroom	Lithography	Special chemcial	hr	150	250	Upon REQ	150
Mask Aligner - MA6	Cleanroom	Lithography	Special chemcial	hr	100	170	Upon REQ	150
Laser Writer - Hiedelberg DWL66+	Cleanroom	Lithography		hr	125	210	Upon REQ	150
MicroWriter - Durham Magneto Optics DL3 Pro	Cleanroom	Lithography		hr	125	210	Upon REQ	150
UV OZONE (L1CR)	Cleanroom	Lithography		hr	20	25	NA	10
Hot Plate 1 (L1CR)	Cleanroom	Lithography		hr	20	25	NA	10
Hot Plate 2 (L1CR)	Cleanroom	Lithography		hr	20	25	NA	10
Spin Coater Laurell (L1CR)	Cleanroom	Lithography	Special photoresist	hr	20	25	NA	30
Spin Coater SPS (L1CR)	Cleanroom	Lithography	Special photoresist	hr	20	25	NA	30
Spin Rinse Dryer (SRD) - L1 CR	Cleanroom	Lithography		hr	20	25	NA	30
Acid Wet Bench - Class 100	Cleanroom	Wet Processing	Special chemcial	per day	25	30	NA	30
Acid Wet Bench - Class 100	Cleanroom	Wet Processing	Special chemcial	per day	25	30	NA	30
Solvent Wet Bench - Class 10	Cleanroom	Lithography	Special chemcial	per day	25	30	NA	30
Solvent Wet bench - L2CR	Cleanroom	Lithography	Special chemcial	per day	25	30	NA	30
Acid Wet bench - L2WL	Wet Lab	Lithography	Special chemcial	per day	25	30	NA	30
Solvent Wet Bench - L2WL	Wet Lab	Lithography	Special chemcial	per day	25	30	NA	30
Magnetic Annealing System - TEL	Cleanroom	Magnetic Process		hr	170	220	NA	250
Multichamber Sputterer - ULVAC	Cleanroom	Magnetic Process	User to bring own wafer	hr	190	288	Upon REQ	300
Ion-Beam Etcher/Sputterer/SIMS - SCIA	Cleanroom	Magnetic Process	User to bring own wafer. Free for SiO2, SiN and Ta2O5.	hr	170	220	Upon REQ	300
FTIR	Cleanroom	Characterization & Metrology		hr	35	50	NA	50
Surface Profiler	Cleanroom	Characterization & Metrology		hr	30	50	Upon REQ	50
Accretech Dicer	Dry Lab	Characterization & Metrology		hr	90	150	Upon REQ	150
FESEM - JEOL JSM 6700F	Dry Lab	Characterization & Metrology		hr	70	120	Upon REQ	100
SEM - NOVA	Dry Lab	Characterization & Metrology		hr	90	150	Upon REQ	100
FIB SEM (FESEM mode only) - TESCAN	Dry Lab	Characterization & Metrology		hr	110	185	Upon REQ	150
FIB SEM (FIB/TOF SIM mode only) - TESCAN	Dry Lab	Characterization & Metrology		hr	250	300	Upon REQ	400
Hitachi Regulas 8230 FE-SEM	Dry Lab	Characterization & Metrology		hr	100	160	Upon REQ	300
Hitachi Regulas 8230 FE-SEM w EDX	Dry Lab	Characterization & Metrology		hr	125	210	Upon REQ	300
Hitachi Regulas 8100 FE-SEM	Cleanroom	Characterization & Metrology		hr	105	165	Upon REQ	320
Hitachi Regulas 8100 FE-SEM w EDX	Cleanroom	Characterization & Metrology		hr	130	215	Upon REQ	320
AFM/SPM - Park NX20	Cleanroom	Characterization & Metrology		hr	90	150	250 / hr	200 basic 200 adv
AFM/SPM - BRUKER Dimension Icon	Dry Lab	Characterization & Metrology		hr	90	150	250 / hr	250
Scanning MOKE - EVICO Magnetics	Dry Lab	Characterization & Metrology		hr	90	150	200 / hr	150

Equipment	Lab Type	Process Type	Consumables Fees Apply	UOM	NUS (PPU)	Public* (PPU)	Engineering Service*	Training Fees*
VSM - MicroSense EZ9	Dry Lab	Characterization & Metrology		hr	70	120	200 / hr	100
SQUID - Quantum Design MPMS 3	Dry Lab	Characterization & Metrology		hr	100	170	270 / hr	150
XRD - RIGAKU SmartLab	Dry Lab	Characterization & Metrology		hr	110	185	* RSM & In-plane - $500 per sample * Others - $300 per sample	250 basic 300 adv
Ellipsometer	Cleanroom	Characterization & Metrology		hr	60	100	Upon REQ	60
Raman and Micro PL System	Dark Room	Characterization & Metrology		hr	70	120	NA	100
Die Bonder	Cleanroom	Packaging		hr	140	235	Upon REQ	200
3D Printer - Optomec Aerosol	Cleanroom	Others	User to bring own ink for printing	hr	270	320	NA	300
3D 2-Photon LItho Printer GT2 - Nanoscribe	Cleanroom	Others		hr	50	88	NA	100
2D Material Transfer Station with Glove Box	Cleanroom	Others		hr	90	150	Upon REQ	200
IR Microscope - Nikon Eclipse L200N	Cleanroom	Others		hr	20	50	NA	50
Laser Micro-machining Service	Dry Lab	Others		ea	NA	NA	Refer to pg 3-4	NA

Remarks:

1. Training fees are charged based on per session (basic w qualification) per person
2. Engineering Service upon request is subject to availability of superuser of the equipment
3. Public rate applies to approved user from higher learning institution, national research institutes and NUS' industry collaborator

PRICE LIST

Valid From: 1-Oct-2019
To: 1-Oct-2020

Address: Block E6, #05-03, Level 5, 5 Engineering Drive 1 S117608
Website: http://e6nanofab.nus.edu.sg/

Product Name (Common wafer size)	Product Number	Laser Machining service	Unit Price (SGD)
Si wafer 2-inch (51 mm) 275um thickness	**# of dice**	**Description of cut**	**Unit price**
Dicing 1mm - 5mm	1	Square or circular shape	45.00
Dicing 5mm - 10 mm	1	Square or circular shape	55.00
Dicing 10mm - 15mm	1	Square or circular shape	65.00
Dicing 15mm - 20mm	1	Square or circular shape	75.00
Dicing 20mm - 25mm	1	Square or circular shape	85.00
Dicing 25mm - 30mm	1	Square or circular shape	95.00
Dicing 30mm - 35mm	1	Square or circular shape	100.00
Dicing 35mm - 40mm	1	Square or circular shape	105.00
Dicing 40mm - 45mm	1	Square or circular shape	110.00
Dicing 45mm - 50mm	1	Square or circular shape	120.00
**Customization*	*Call for quote*	*Custom non-standard shape*	*Call for quote*

Si wafer 3-inch (76 mm) 375um thickness	**# of dice**	**Description of cut**	**Unit price**
Dicing 1mm - 5mm	1	Square or circular shape	85.00
Dicing 5mm - 10 mm	1	Square or circular shape	95.00
Dicing 10mm - 15mm	1	Square or circular shape	105.00
Dicing 15mm - 20mm	1	Square or circular shape	110.00
Dicing 20mm - 25mm	1	Square or circular shape	115.00
Dicing 25mm - 30mm	1	Square or circular shape	120.00
Dicing 30mm - 35mm	1	Square or circular shape	125.00
Dicing 35mm - 40mm	1	Square or circular shape	135.00
Dicing 40mm - 45mm	1	Square or circular shape	145.00
Dicing 45mm - 50mm	1	Square or circular shape	150.00
**Customization*	*Call for quote*	*Custom non-standard shape*	*Call for quote*

Si wafer 4-inch (100 mm) 525um thickness	**# of dice**	**Description of cut**	**Unit price**
Dicing 1mm - 5mm	1	Square or circular shape	110.00
Dicing 5mm - 10 mm	1	Square or circular shape	115.00
Dicing 10mm - 15mm	1	Square or circular shape	120.00
Dicing 15mm - 20mm	1	Square or circular shape	125.00
Dicing 20mm - 25mm	1	Square or circular shape	130.00
Dicing 25mm - 30mm	1	Square or circular shape	135.00
Dicing 30mm - 35mm	1	Square or circular shape	140.00
Dicing 35mm - 40mm	1	Square or circular shape	145.00
Dicing 40mm - 45mm	1	Square or circular shape	150.00
Dicing 45mm - 50mm	1	Square or circular shape	155.00
**Customization*	*Call for quote*	*Custom non-standard shape*	*Call for quote*

Product Name (Common wafer size)	Product Number	Laser Machining service	Unit Price (SGD)
Si wafer 5 - 8 inch (125 mm - 200 mm) 625um - 725um thickness	**# of dice**	**Description of cut**	**Unit price**
Dicing 1mm - 5mm	1	Square or circular shape	125.00
Dicing 5mm - 10 mm	1	Square or circular shape	130.00
Dicing 10mm - 15mm	1	Square or circular shape	135.00
Dicing 15mm - 20mm	1	Square or circular shape	140.00
Dicing 20mm - 25mm	1	Square or circular shape	145.00
Dicing 25mm - 30mm	1	Square or circular shape	150.00
Dicing 30mm - 35mm	1	Square or circular shape	155.00
Dicing 35mm - 40mm	1	Square or circular shape	160.00
Dicing 40mm - 45mm	1	Square or circular shape	165.00
Dicing 45mm - 50mm	1	Square or circular shape	170.00
**Customization*	*Call for quote*	*Custom non-standard shape*	*Call for quote*

Remarks:	*If design fall above 50mm for a 4.9 inch wafer etc: 65mm cost will be $205 + $170.*
Lead time	1. Typically 2-4days upon job confirmation. 2. Urgent job is available at $50 additional fees with 1 day lead time (eg. job submission on Tuesday and ready by next working day)
Job requirement	*1. Users are to provide accurate drawing in DXF format.* *2. All silicon wafers to be cut will be provided by user.* *3. Silicon wafers are available at additional charges.*
Pricing and payment	*Payment should be made prior job commencement. Price listed is for non-educational entities. For departments within NUS, 10% off waiver.*
Terms and condition	*1. There will be no change of design upon job confirmation.* *2. Inform us about special job tolerances requirement. Additional charges may apply.* *3. We reserve the rights to reject any jobs that we deem unacceptable.* *4. The stipulated terms and conditions are subject to change without prior notice. .*

Tool Rates Terms and Conditions

1 All rates are subject to changes without prior notice.

2 All users are to book the facility BEFORE usage in E6NanoFab tool booking system.

2.1 Users will be charged 2 times the usage fees for tools used without prior booking for 1st offence.

2.2 Users will be barred from using the system for 3 weeks in addition to being charged twice the normal rate.

3 All users are to update the actual tool usage hours in E6NanoFab tool booking system and the log book of the tool.

3.1 For tools used beyond the last reserved session, users will be charged 2 times the usages fees if the intended extension hours of tool is not booked within 15 minuts from the last reserved end time.

3.2 E6NanoFab reserves the right to charge an admin fees for assisting users with updating the extended tool usage hour in the tool booking system.

4 Users will be granted a maximum 15 minutes waiting time for the reserved tool. In event of no-show, users will be charged based on the following protocol:

In the case of a 3-hour reserved tool by user A in the tool booking system:
User A did not show up within 15 minutes will pay for the 1st hour of the booking.

User B who takes over the slot from User A will pay for the duration of the time he/she used it.

If nobody takes over User A's reserved slot, User A will have to pay for the entire 3-hour booking rate.

Guidelines on using E6NanoFab Tools

1 Only qualified users are allowed to book the system.

2 All users are to seek permission from his/her supervisor prior to using the system so as to avoid any disputes arising from the supervisor. E6NanoFab will not entertain the dispute, if any.

3 All users are liable for any damage or breakdown of the system duet to mishandling or improper usage.

4 It is mandatory that users sign in and sign out in the facility log book. This shall be the actual time spent in using the system.

4.1 User is reminded to update the actual hour usage in the tool booking system immediately after use. Otherwise, administration fees will be charged for helping user with the update.

5 Users are to UNLOAD the sample(s) and keep the system back to its normal condition BEFORE the next slot starts. Failing to do so, users will be liable to pay for the additional time taken to make the system back to its normal condition.