

Carnegie Mellon Nanofabrication Facility rates for the 2018-2019 fiscal year are listed in the following tables. Carnegie Mellon internal users and external U.S. Federal, state, or local government organizations are charged at the "CMU" rate. External academic and 501(c)(3) charitable organizations are charged at the "Academic" rate. External corporate/industry users are charged at the "Corporate" rate.

NANOFAB FEES / SERVICES	CHARGE TYPE	CMU	ACADEMIC	CORPORATE
Entry Fee	Per Day	\$20.00	\$24.00	\$37.70
Nanofab Process Development/Labor	Per Hour	\$50.00	\$60.00	\$94.25
Nanofab Training Fee	Per Hour	\$25.00	\$30.00	\$47.13
Wafer Dicing Service	Per Hour	\$85.00	\$102.00	\$160.23

THIN-FILM DEPOSITION TOOL RATES	CHARGE TYPE	CMU	ACADEMIC	CORPORATE
Aluminum Nitride Deposition System	Per Run	\$75.00	\$90.00	\$141.38
Anatec Gold Coater	Per Run	\$50.00	\$60.00	\$94.25
Angstrom Engineering Covap II Thermal Evaporator	Per Run	\$75.00	\$90.00	\$141.38
Cambridge Nanotech Fiji ALD System	Per Run + Precursor Fees	\$75.00	\$90.00	\$141.38
Commonwealth Scientific Ion Beam Deposition System	Per Run	\$75.00	\$90.00	\$141.38
Copper Electroplating System	Per Run	\$50.00	\$60.00	\$94.25
Nickel Electroplating System	Per Run	\$50.00	\$60.00	\$94.25
CVC Connexion Sputtering System	Per Run	\$75.00	\$90.00	\$141.38
GVD Corporation iLab CVD	Per Run	\$75.00	\$90.00	\$141.38
GVD Corporation oLab CVD	Per Run	\$75.00	\$90.00	\$141.38
Kurt J. Lesker PVD 75 Electron Beam Evaporator	Per Hour	\$85.00	\$102.00	\$160.23
Kurt J. Lesker PVD 75 Sputtering System	Per Hour	\$85.00	\$102.00	\$160.23
Leybold-Heraeus Z-400 Sputtering Systems #1 & #2	Per Run	\$75.00	\$90.00	\$141.38
Nanofab Sputtering Systems #1 - #5	Per Run	\$75.00	\$90.00	\$141.38
Perkin Elmer 2400 6J Sputtering System	Per Run	\$75.00	\$90.00	\$141.38
Perkin Elmer 2400 8L Sputtering System	Per Run	\$75.00	\$90.00	\$141.38
SCS Labcoter 2 Parylene Deposition System	Per Run	\$50.00	\$60.00	\$94.25
Tegal AMS AIN Sputtering System	Per Run	\$75.00	\$90.00	\$141.38
Trion Orion II PECVD System	Per Run	\$75.00	\$90.00	\$141.38
Ultek E. Beam Evaporator	Per Run	\$75.00	\$90.00	\$141.38

ETCHING, POLISHING, & DICING TOOL RATES	CHARGE TYPE	CMU	ACADEMIC	CORPORATE
IPC Barrel Etcher	Up to a 15 Min Run	\$20.00	\$24.00	\$37.70
	Up to a 30 Min Run	\$35.00	\$42.00	\$65.98
	Up to an Hour Run	\$50.00	\$60.00	\$94.25
	Each Additional Hour Per Run	\$10.00	\$12.00	\$18.85
Plasma-Therm 790 RIE System	Up to a 15 Min Run	\$25.00	\$30.00	\$47.13
	Up to a 30 Min Run	\$40.00	\$48.00	\$75.40
	Up to an Hour Run	\$65.00	\$78.00	\$122.53
	Each Additional Hour Per Run	\$10.00	\$12.00	\$18.85
Plasma-Therm Versaline ICP RIE	Up to a 15 Min Run	\$30.00	\$36.00	\$56.55
	Up to a 30 Min Run	\$50.00	\$60.00	\$94.25
	Up to an Hour Run	\$75.00	\$90.00	\$141.38
	Each Additional Hour Per Run	\$25.00	\$30.00	\$47.13
SPTS Primaxx Uetch Vapor HF Etcher	Per Cycle up to 4 Cycles	\$20.00	\$24.00	\$37.70
	Each Additional Cycle after 4 Cycles	\$5.00	\$6.00	\$9.43
Surface Technology Systems Multiplex ICP RIE & Aspect Cluster ICP RIE / AOE	Up to a 15 Min Run	\$30.00	\$36.00	\$56.55
	Up to a 30 Min Run	\$50.00	\$60.00	\$94.25
	Up to an Hour Run	\$75.00	\$90.00	\$141.38
	Each Additional Hour Per Run	\$25.00	\$30.00	\$47.13
Trion Phantom II RIE System	Up to a 15 Min Run	\$25.00	\$30.00	\$47.13
	Up to a 30 Min Run	\$40.00	\$48.00	\$75.40
	Up to an Hour Run	\$65.00	\$78.00	\$122.53
	Each Additional Hour Per Run	\$10.00	\$12.00	\$18.85

ETCHING, POLISHING, & DICING TOOL RATES (CONTINUED)	CHARGE TYPE	CMU	ACADEMIC	CORPORATE
Commonwealth Scientific Ion Beam Etching Systems #1 & #2	Per Run	\$75.00	\$90.00	\$141.38
Samco UV-1 Ozone Cleaner	Per Run	\$20.00	\$24.00	\$37.70
Strasbaugh 6EC CMP	Per Hour	\$50.00	\$60.00	\$94.25
Tousimis Critical Point Dryer	Per Run	\$50.00	\$60.00	\$94.25

LITHOGRAPHY TOOL RATES	CHARGE TYPE	CMU	ACADEMIC	CORPORATE
ASML 5500/80 i-Line Wafer Stepper	Per Hour	\$100.00	\$120.00	\$188.50
Elionix ELS-G100 Electron Beam Lithography System	Per Hour	\$125.00	\$150.00	\$235.63
FEI Sirion SEM with Naby E. Beam Lithography System #1 & #2	Per Hour	\$75.00	\$90.00	\$141.38
Heidelberg DWL 66FS	1st Hour	\$50.00	\$60.00	\$94.25
	2nd Hour	\$25.00	\$30.00	\$47.13
	3rd Hour	\$10.00	\$12.00	\$18.85
	4th - 24th Hour	\$5.00	\$6.00	\$9.43
	25th Hour - ???	Charges start over from 1st hour and		
Hot Pack Vacuum Oven	Per Run	\$25.00	\$30.00	\$47.13
Karl Suss MA56 Mask Aligner	Per Hour	\$60.00	\$72.00	\$113.10
Karl Suss MA6 Mask Aligner	Per Hour	\$70.00	\$84.00	\$131.95
Karl Suss MJB3 Mask Aligner	Per Hour	\$50.00	\$60.00	\$94.25
YES HMDS Vapor Prime Oven	Per Run	\$25.00	\$30.00	\$47.13

FURNACE / ANNEALING TOOL RATES	CHARGE TYPE	CMU	ACADEMIC	CORPORATE
AG Associates Rapid Thermal Annealer	Per Run	\$50.00	\$60.00	\$94.25
Annealing Furnace	Per Run (Without Gas)	\$25.00	\$30.00	\$47.13
	Per Run (With Gas)	\$50.00	\$60.00	\$94.25
Magnetic Field Vacuum Annealer	Per Run	\$50.00	\$60.00	\$94.25
Oxidation Furnace	Per Run	\$150.00	\$180.00	\$282.75
Thermcraft 2" Barrel Furnace	Per Run	\$50.00	\$60.00	\$94.25
	Per Run (With Gas)	\$75.00	\$90.00	\$141.38
Vapor-Temp Relative Humidity Chamber	Per Run	\$25.00	\$30.00	\$47.13

METROLOGY / INSPECTION TOOL RATES	CHARGE TYPE	CMU	ACADEMIC	CORPORATE
KLA-Tencor P-2 and P-15 Profilometers	Per Hour	\$50.00	\$60.00	\$94.25
Nanometrics Nanospec 210XP	Per Hour	\$40.00	\$48.00	\$75.40
Olympus MX80 Microscope With Optronics Digital Camera System	Per Day	\$25.00	\$30.00	\$47.13
Tencor Alpha-Step 200 Profilometer	Per Hour	\$40.00	\$48.00	\$75.40
Tencor Flexus Stress Measurement System	Per Hour	\$50.00	\$60.00	\$94.25
FEI Sirion SEM With Nabyty E. Beam Lithography System #1 & #2	Per Hour	\$75.00	\$90.00	\$141.38

Hourly Rates

Machine time for hourly equipment is logged to the nearest tenth of an hour and totaled monthly. Although there is no minimum charge per day, there is a half hour minimum charge per month. The Heidelberg DWL 66FS, IPC Barrel Etcher, Plasma-Therm 790, Plasma Therm Versaline, Surface Technology Systems Aspect Cluster RIE/AOE System, Surface Technology Systems Multiplex ICP RIE System, SPTS Primaxx Uetch Vapor HF Etcher, and Trion Phantom II RIE System have a tiered rate structure as shown on the rate table. The tiered rates are available for consecutive run times only.

Precursor Fees

Atomic layer depositions are subject to an additional fee to compensate for the high cost of the precursors. Fees will vary by precursor and will be calculated based on precursor cost at time of purchase divided by the projected number of runs. Fees may range from \$5.00 per 10nm to more than \$100 per 10nm depending on the material. Specialty materials, such as Pt, are especially costly. Users should contact Nanofab staff regarding questions about precursor costs.

Precious Metal Fees

Precious metal thin film depositions are subject to an additional fee to compensate for the high cost of the material. These prices are subject to change based on current market values.

Sputtering runs are charged the following additional fee (pre-sputtering is added to the total deposition):

- Gold: \$10.00 per every 100 Nanometers per run.
- Platinum: \$13.00 per every 100 Nanometers per run.

Precious metal evaporation sources are weighed before and after evaporation to determine the amount used. The fee per run is based on the current Engelhard Fabricated Precious Metal Price plus 25% to cover reclamation and fabrication costs.

Monthly Expense Caps

The Carnegie Mellon Nanofabrication Facility has an expense cap on entry and equipment fees charged to Carnegie Mellon users, as well as 501(c)(3) and U.S. federal, state, and local government organizations (there is no cap for external corporate users). Cap fees are as follows:

Carnegie Mellon Users and U.S. Federal, State, and Local Government Users

- The entry fee cap is \$250 a month per user per account number
- The equipment fee cap is \$2,500 a month per user per account number

501(c)(3) Users

- The entry fee cap is \$300 a month per user per account number
- The equipment fee cap is \$3,000 a month per user per account number

These caps are the maximum amount that an individual user's account can be charged in a single calendar month. The cap begins on the 1st of every month and goes until the last day of that month. Multiple users using the same account number or working for the same organization (in the case of external 501(c)(3), U.S. Federal, State, and Local Government Organizations) are each subject to their own cap. One user using multiple account numbers is subject to a cap for each account number. Labor fees, material fees, and service fees are not subject to the cap.