

### **Commercial Pricing Schedule for 2011 Academic Year – 7/11 to 9/12**

#### **Service Fees:**

- **Maskmaking**
  - Soda Lime mask – 5" X 5" X 0.09" – LR Chrome
    - \$ 650 per mask generated
    - 0.5um MEBES spot size,
    - Up to 2.5 hours write time - \$60/hr for extra write time beyond
    - No defect inspection.
    - Assumes mask design is sent in gds format – extra charges may apply if file conversion is needed.
  - Quartz mask – 6" X 6" X 0.12" – LR Chrome
    - \$ 850 per mask generated
    - 0.5um MEBES spot size,
    - Up to 2.5 hours write time - \$60/hr for extra write time beyond
    - No defect inspection.
    - Assumes mask design is sent in gds format – extra charges may apply if file conversion is needed.
- **Staff Time**
  - The SMFL staff is available to perform NRE tasks on an hourly basis.
  - \$ 75 per hr Staff Process Engineering Time.
  - \$125 per hr Staff Senior Process Engineer Time.
- **Cleanroom Time**
  - The SMFL cleanroom is also available for Industrial non-members general use, inspection, packaging, etc.
  - \$ 75 per hr - General use of Cleanroom – no tool use included.

### Materials Charges

- **Wafers** - Not provided/for sale by SMFL
- **Chemicals**

The SMFL provides standard photoresist and developer for use on its equipment – the cost (including disposal) is included in the price of the tool.

Chemicals brought into the SMFL by the customer will be assessed a disposal fee dependant on the nature of the waste. Fees will be higher for metal etchants, solvent/acid mixtures, and others that must be sent out for disposal.

- **Notes**
  - Users are free to obtain their own supplies, but RIT carries no responsibility to supply storage space for materials stockpiles. Chemicals must be approved and properly shipped before being brought into the SMFL. Users will be charged up front for disposal fees incurred.
  - Repair parts for tools and equipment above and beyond normal wear and tear may also be charged back to the user on a cost basis, not including SMFL labor.
  - Materials charges include but are not limited to consumable chemicals, sputter targets, evaporation sources, photographic film, and quartzware (breakage).
  - Incidental materials such as aluminum targets and evaporants, standard lithography chemicals, standard CVD and etch gases, bulbs for aligners are covered under the fee schedule.
  - The user may be asked to pay a surcharge for equipment/materials usage above and beyond normal usage. This would be negotiated before the work started.

### Equipment Set

Tool charges are computed from when a user logs onto a tool to when a user logs off the tool. The tool time can and will include setup, programming, warm-ups and pumpdowns in addition to any actual process time. No distinction is made on how the tool is being used, whether process or otherwise. All time logged on the tool is charged at the tool rate.

Area	RIT Tool	Used For	Commercial Price (\$/hr)
CMP	Ecomet Polisher	Polishing of SEM Samples	\$51.00
CMP	Strausbaugh CMP	CMP of wafers w/ metal	\$125.00
CVD	AME P5000 PECVD/RIE	Deposition / Etch of Oxide & Nitride	\$250.00
CVD	ASM 150mm LPCVD	Deposition of nitride, poly, LTO	\$125.00
CVD	SMFL Paraylene Coater	Deposition of parylene	\$125.00
Dry Etch	Branson L3200 Asher	Downstream oxygen ash of organics	\$60.00
Dry Etch	Drytek Quad RIE	Dry etching of nitride, poly, oxide	\$125.00
Dry Etch	GaSonics Asher	Ash of organics	\$110.00
Dry Etch	LAM 4600 Metal Etch	Dry etching of metal	\$250 - 1 Hr Min
Dry Etch	Lam 490 Plasma Etch	Plasma etch of nitride, poly	\$120.00
Dry Etch	Trion Etcher		\$125.00
Dry Etch	Xactix	Bulk Isotropic Si Etching	\$120.00
Lith	ASML Stepper	5x I-line exposure tool	\$290.00
Lith	CEE 100 Coater	Photoresist Coat	\$65.00
Lith	CEE 100 Developer	Photoresist Develop	\$80.00
Lith	GCA gline Stepper	5x g-line exposure tool	\$150.00
Lith	KS MA150 Aligner	Contact printer	\$90.00
Lith	KS MA56 Aligner	Contact printer	\$90.00
Lith	SCS Hand Coater	Hand spinning of resist	\$50.00
Lith	SSI Track	150mm i-line coat and develop	\$105.00
Lith	SVG 88 Track	100mm g-line coat and development	\$75.00
Metrology	AMRAY 1830 #2 SEM	SEM	\$150.00
Metrology	CDE Res Map	Sheet resistivity mapper	\$75.00
Metrology	Phi Auger	Sputtering	\$450.00
Metrology	Prometrix SM300 SpectraMap	Film Thickness Measurement	\$75.00
Metrology	Surface Charge Analyzer	Surface Charge Analyzer	\$105.00
Metrology	Tencor P2 Profilometer	Contact film thickness measurement	\$65.00
Metrology	Woollum VASE Ellipsometer	Optical Measurement of Thin Films	\$75.00
Metrology	Wyko Dynamic Optical Profiler	Optical height measurement	\$80.00
Packaging	KS780 Dicing Saw	Dicing saw	\$90.00
Packaging	Tempress 602 Dicing Saw	Dicing saw	\$75.00
PVD	Anatech Sputter	SEM Preparation	\$125.00
PVD	CHA Ebeam Evap	Evaporator	\$125.00
PVD	CHA Flash Evaporator	Evaporation of Al	\$75.00
PVD	CVC 601 Sputter	Sputtering	\$75.00
PVD	CVC Evap	Evaporator	\$75.00
PVD	Denton Desktop Au Sputter	SEM Preparation	\$125.00
PVD	Nanomaster Sputter	Sputtering	\$75.00
PVD	PE2400A Sputter	Sputtering	\$100.00
PVD	PE2400B Sputter	Sputtering	\$100.00
PVD	PE4410 Sputter	Sputtering	\$125.00
Thermal	AG 610 RTP	Rapid thermal processing	\$145.00
Thermal	Bruce Furnace (1-4)	Oxide growth and thermal process	\$60.00
Thermal	Bruce Furnace (5-8)	Oxide growth and thermal process	\$60.00
Thermal	Heraus Vac Oven	Thermal vacuum curing	\$75.00
Thermal	Varian 350D Implanter	Ion implantation	\$225.00
Wet	Wet Bench - Al Etch / Solvent	Wet etch of Al and organics	\$75.00
Wet	Wet Bench - General RCA	RCA Clean	\$75.00
Wet	Wet Bench - Manual Processing 2 w/HP	General use wet bench	\$75.00
Wet	Wet Bench - MOS RCA	RCA Clean - Critical	\$85.00
Wet	Wet Bench - Nitride Etch / KOH	Wet etch of Nitride & Silicon	\$85.00
Wet	Wet Bench - Ultrasonic	Cleaning & liftoff	\$60.00



## *Semiconductor & Microsystems Fabrication Laboratory*

### **Approvals**

Member users performing their own work in the SMFL must first sign the SMFL Visitor Agreement before any work may proceed. Member users performing their own work in the SMFL are also required to go through the SMFL Safety Training on a yearly basis.

### **Billing Process**

The SMFL will provide the user with a quotation for the work to be performed in the SMFL. The quotation must be approved / signed by the customer and returned to RIT before work can begin. Users may pay for their usage with either a Company PO or Credit Card (Visa, MC). Invoices are typically sent out at the end of each month.

### **Notes**

Minimum time for the LAM4600 will be 1 hour.

An overnight pumpdown on our PVD tools will the processing run occurring the following morning is charged out at 5 hours.