

Services Offered

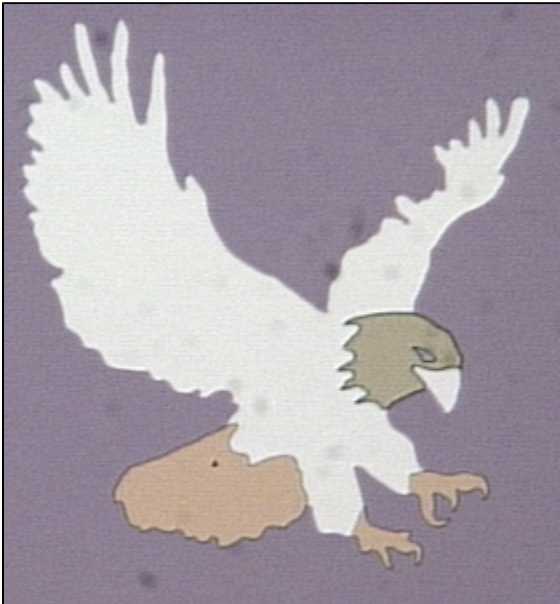
Pricing Information

Information on the hourly rates for SMFL tools and mask prices

SMFL Services and Capabilities

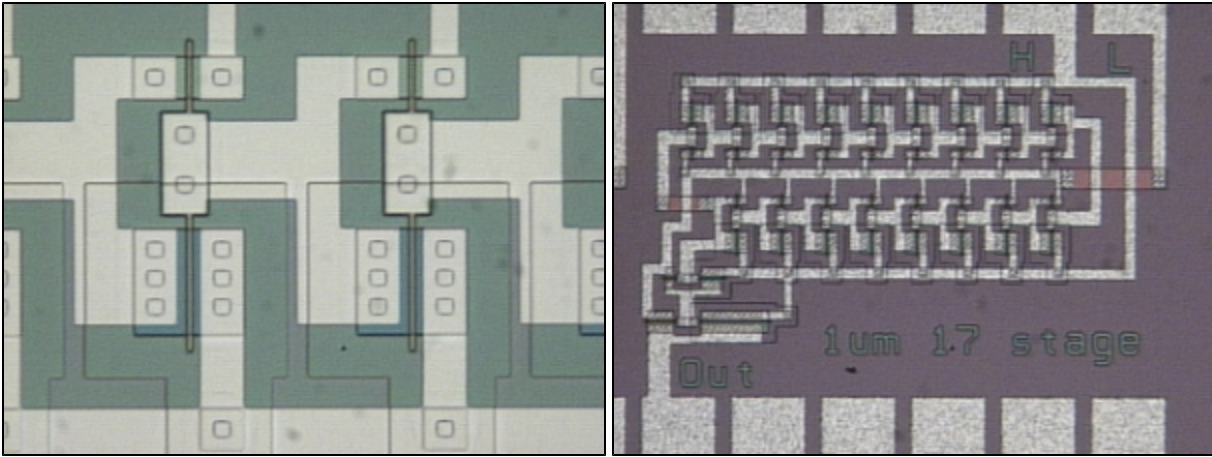
The capabilities of the SMFL include:

- Wafer cleaning, ion implantation and diffusion, and high temperature processing both with conventional tube furnaces and RTP systems.
- CVD / PECVD deposition capabilities are available for oxides, nitrides, and polysilicon. A variety of vacuum systems are available for sputtering and thermal evaporation of metals and dielectrics.
- Lithography, including automated coating and development systems combined with a set of two 5:1 steppers with capabilities down to 0.40 microns, as well as 1:1 contact lithography and an electron beam exposure system for photo mask production.
- Plasma etch capabilities for silicon, oxides, nitrides, and metals and provision for a broad variety of wet chemical etch processes as well as copper electroplating and CMP.
- Complete prototyping of devices and systems with help from the electrical and surface analytical characterization labs, microelectronics layout and computer simulation facilities, and in-house industry-standard electronics packaging capability.



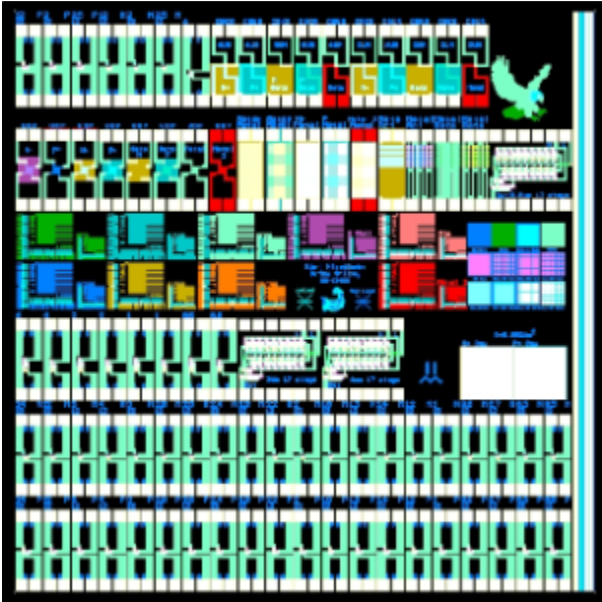
The SMFL offers a wide range of services from single process up to foundry services. It is by no means a complete list, please [contact us](#) so that we can discuss your needs.

Foundry Services



The SMFL has a 2um CMOS process with an effective L of 1.5um.

- We have run this process for customers using their design and incorporating our test structure for test verification.
- Aluminum and Tungsten gate metals have been processed - others are possible.
- Our Vt's are well matched but implant splits are possible.
- Typical run time is ~8 weeks



[Details about the SMFL CMOS Process, Performance, Specifications, and Options](#)

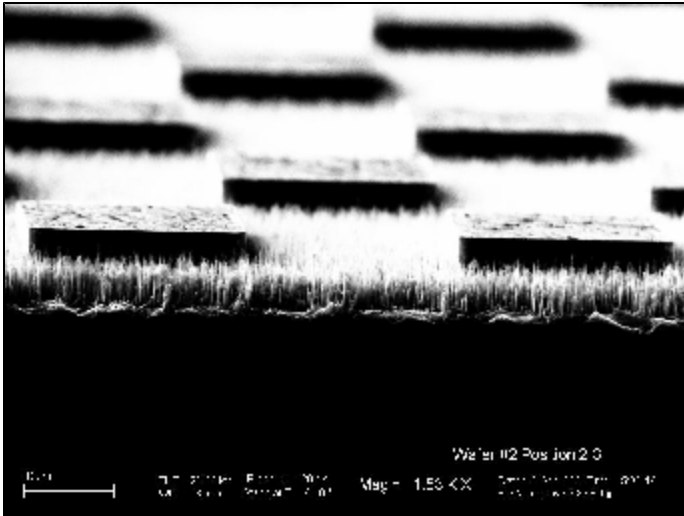
If you require this information or a quote on your process, please contact T. Grimsley

Single Process Services

Metrology

Scanning Electron Microscopy

LEO EVO 50 LaB6 system.



Film Thickness - Ellipsometry

- [Woollam VASE](#) with Autoretarder operating at wavelengths from 240-1700nm and variable angle of incidence.
- [Rudolph Auto EL IV](#) operating at three wavelengths

Film Thickness - Profilometry

- [Tencor P2](#) is a long length scanning profilometer useful for measuring step heights.

Film Thickness - Optical

- [Prometrix SpectraMap SM300](#) and two [Nanometrics Spectrophotometers](#) that provide noncontact optical film thickness measurement mapping - Resist, oxide, nitride.

Resistivity Measurements'

- [CDE Res Map](#) provides sheet resistance and resistivity mapping of silicon wafers and films.

Thin Film Deposition

Sputter Deposition

- The SMDL has a variety of DC and RF deposition tools. The [PE 4410](#) is loadlocked and has sputter etch capability.
- A wide variety of targets exist in bonded 8" form and unbonded 4" targets for the sputter head on the [CVC 601 Sputter](#).
 - Al/Si, Ti, Cr, W/Ti, Cu, Mo, Ta - 8" bonded, water cooled targets
 - Cu, Ti, Ni, Cr, Ge, InSn, Mo, NiCr - 4" target for sputter head

Thermal Evaporation

- The SMFL has [two thermal evaporators](#) - one is a basket style for various metals and the other is a flash evaporator for deposition of aluminum.

Electron Beam Evaporation

The SMFL has a [CHA Ebeam Evaporator](#) with a 3KV electron beam gun with an eight pocket carousel.

Plasma Enhanced Chemical Vapor Deposition (PECVD)

The SMFL has an Applied Materials P5000 systems equipped with two deposition chambers

- [TEOS Oxide](#) from a few nanometers to many microns can be deposited
- [PECVD nitride and amorphous silicon](#) can also be deposited.

Low Pressure Chemical Vapor (LPCVD)

- Our [ASM LPCVD](#) system is capable of depositing Nitride, Poly and Low Temp Oxide.

Short Courses

The SMFL has run hands on courses in Cleanroom Etiquette, MEMS Processing, and Thin Films.

We can custom tailor a course to suit the needs of your organization. [Please contact us and we can discuss your requirements.](#)

A complete listing of all of the Tools in the SMFL can be found [here](#)