

Micro and Nanofabrication Clean Room

Techniques and equipment

METALLIZATION

Metal thin films of a variety of materials can be deposited by Physical Vapour Deposition techniques on either DC and DC/RF sputtering systems, or on thermal and e-beam evaporation systems.

Surface: 93 m²

Available technologies

- *Physical Vapor Deposition (PVD): Sputtering and Evaporation.*

Equipment

1) Sputtering:

a) **KENOSISTEC KS800H:**

- Sputtering system to deposit metallic layers on 100 mm or 150 mm wafers.
- Process chamber with three (200 mm) circular planar magnetron cathodes.
- Available targets: Al_{99.5}/Cu_{0.5}, Ti and Cu.
- Load lock chamber with semi-automatic loading system.
- DC power and RF for sputter etching.
- Possibility to process CMOS or no-CMOS wafers (no-CMOS without etching).



b) Material Research Corporation-MRC 903:

- Sputtering system to deposit metallic layers on a 30 x 30 cm² pallet surface (up to nine 100 mm wafers or up to four 150 mm wafers).
- Process chamber with three cathodes (two are rectangular planar magnetron-type and the other is a rectangular planar diode).
- Available targets: Au, Ni and Ti.
- Load lock chamber with semi-automatic loading system.
- DC power for Ti/Ni and RF power for Au. Also RF for sputter etching.
- Aimed at no-CMOS wafers.



c) KENOSISTEC KS500C:

- Sputtering system to deposit metallic and semiconducting layers on 100 mm or 150mm wafers.
- Process chamber with three cathodes (75 mm) magnetron circular planar in confocal configuration.
- Available targets: W, Ti, Ta, Si and TaSi₂
- Load lock chamber with semi-automatic loading system.
- DC power supply source plus RF power supply for one cathode (to deposit Si). Possibility to sputter etching (RF).
- Possibility to process CMOS and no-CMOS wafers (no-CMOS without etching).



d) LEYBOLD HERAEUS Z-550:

- Sputtering system to deposit metallic layers on 100 mm wafers.
- Process chamber with a circular planar magnetron cathode.
- Available targets: Al, Al_{98.75}/Cu_{0.5}/Si_{0.75} and TaSi₂.
- Load lock chamber and manual loading system.
- DC power supply source. Possibility to sputter etching (RF).
- Possibility to process CMOS or no-CMOS wafers (no-CMOS without etching).



e) KENOSISTEC KS800HR:

- Sputtering system to deposit metallic and non-metallic layers on 100 mm, 150 mm wafers.
- Process chamber with four (200 mm) circular planar magnetron cathodes.
- Available targets: Al, Al_{99.5}/Cu_{0.5}, Ti, W, Si, AlN, TiN, Si₃N₄, SiO₂
- Load lock chamber with semi-automatic loading system.
- Possibility to heat samples up to 400 °C
- Pulsed DC and RF power supply sources, plus RF for sputter etching.
- To process no-CMOS samples



f) **BIO RAD E-5000 Polar Division:**

- Sputtering system to deposit gold layers for scanning electron microscopy.
- Possibility to change distance and current.
- Stopwatch to time control.



2) **Evaporation:**

a) **OERLIKON UNIVEX 450B:**

- One electron gun source with four pockets and two thermal sources.
- Maximum sample area size: 150 mm.
- Process chamber capacity up to four wafers (Manual loading system without load lock chamber)
- Available materials: Ag, Al, Al₂O₃, Au, B, C, Cr, Cu, Fe, ITO, Mo, Nb, Ni, Pd, Pt, Sn, Ta, Ti, W, ZnO and Zr.
- Possibility to heat samples up to 500°C.
- Residual gas Analyzer.
- Available deposition in low O₂ pressure.
- To process no-CMOS samples.



b) KENOSISTEC KE500E:

- One electron gun source with four pockets.
- Maximum sample area size: 150 mm.
- Process chamber capacity limited to one wafer (manual loading system without load lock chamber).
- Available materials: Al, Cr, Ti.
- Exclusively to process CMOS samples.



c) LEYBOLD UNIVEX 400:

- One electron gun source with eight pockets
- One i-gun source.
- Maximum sample area size: 150 mm.
- Process chamber capacity of one wafer with load lock chamber.
- Possibility to cool samples between -20 and 100 °C.
- Possibility to sample rotation during deposition
- Available materials: In test: (Ti, Au, Al)
- To process no-CMOS samples.



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