

MICRO & NANO FABRICATION

The AIT Austrian Institute of Technology offers customized services for simulating, fabricating and characterizing micro- and nano-technological structures and devices. The laboratories are well equipped with state-of-the-art facilities and our unique expertise relies on combining semiconductor technologies and thin film processes with innovative concepts from micro-, nano- and bio-sciences. Prospective clients are encouraged to contact us. We will be happy to help you select the appropriate methods and processes to tackle your technical challenges.



INKJET DEPOSITION

Material printing

- Printable materials: metals, resins, organic conductors, biofunctional inks, etc.
- Wide compatibility with solvents
- Substrates: polymers and metal (film and bulk), glass, silicon, ceramics, etc.
- Substrate alignment using reference markers
- Min. feature size: 20µm
- Max substrate size: 210mm x 260mm (A4)

THIN FILM DEPOSITION

Magnetron sputtering

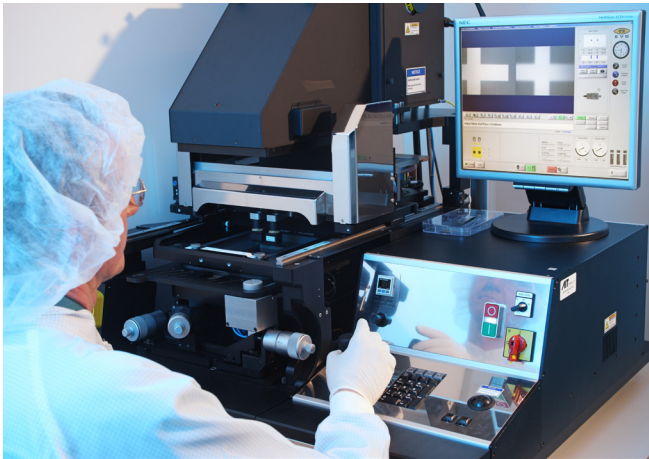
- Precise deposition control
- Typical layer thickness: 5nm – 1000nm
- Four chamber UHV vacuum system
- Eleven target positions (stacking of up to 11 layers)
- DC and RF sputtering
- More than 30 different materials available: metals, semiconductors, insulators (e.g. Au, Al, Cu, ZnO, ITO, Al₂O₃, MgO)
- Further materials on request
- Max. wafer size: 100mm (4")

Evaporation

- Typical layer thickness: 5nm – 1000nm
- Two thermal sources and one e-beam source
- More than 10 different materials available among metals and insulators (e.g. Ti, Cr, Au, Al, MgF)
- Further materials on request
- Max. wafer size: 100mm (4")

Electrochemical deposition

Metals and semiconductors on conductive substrates



MICRO- & NANOPATTERNING

Optical lithography

- Min. feature size: 2 μ m
- Max. wafer size: 100mm (4")

Electron-beam lithography

- Min. feature size <100nm
- Max. wafer size: 150mm (6")

Atomic force microscope lithography

ETCHING

Argon ion etching

- Etch stop control (mass spectrometer)
- Max. wafer size: 100mm (4")

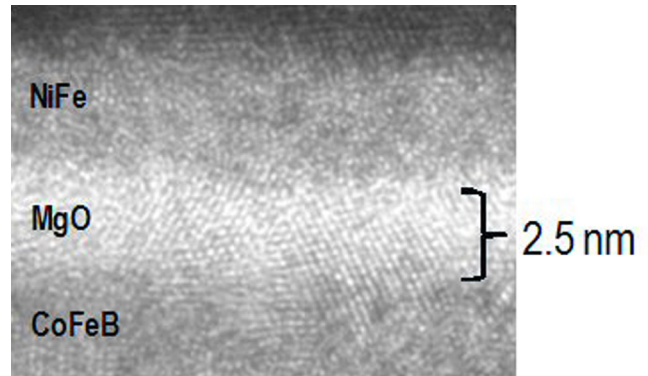
Wet chemical etching

Oxygen plasma ashing

- Microwave barrel asher
- Heatable substrate holder

APPLICATION EXAMPLES

- Deposition of single and multilayer films
- Printing of materials using custom formulated inks (e.g. biomaterials, graphene)
- Patterning of micro- and nanostructures
- Synthesis of nanoparticles
- Fabrication of transparent conductive films
- Sensor prototyping
 - Magnetic field sensors (GMR, TMR)
 - Magnetic flux concentrators
 - Integrated photonic waveguides & sensors
 - Mid-infrared sensors
 - Capacitive sensors
 - Conductive sensors
- Printing of devices on flexible substrates



MgO Barrier of a magnetic tunnel junction

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