

Target Fabrication Capabilities

Thin Film Coating

- Thin Film Coating of a range of metals (10nm up to a few microns, in-house. Thicker coatings may be available by special arrangement) and plastics (Formvar, Polystyrene and Polyethylene, Parylene N and C).
- CVD production of DLC (Diamond-Like-Carbon).
- Amorphous Carbon foils from a few nm up to a few microns.

Micromachining

- World leading micro-machining to produce hohlraums, cones and other geometries
- Access to diamond point turning for high precision surfaces
- Laser micromachining for non-contact processing of parts and complex 2D geometric cutting.

Laser micromachining

- **1033nm 290fs Pharos**
 - 70mm scan field. 300mm XY stages 100mm Z stage
 - Aerotech Stages: X 250mm x Y 150mm x Z 100mm
 - Scanlab scanner
 - Aerotech control system
- **355nm Coherent Avia**
 - 38mm scan field. 500mm XY stages 5mm Z stage
 - Aerotech Stages: X >300mm x Y >300mm x Z 5mm
 - Scanlab scanner
 - Aerotech control system
- **193/248nm Excimer Lambda Physik L1000**
 - 193nm (x10 projection lens) – and other lens options
 - 248nm (x4 projection lens) – and other lens options
 - Aerotech Stages: X400mm x Y400mm x Z 5mm: X and Y are approx.
 - Mask travel: 450x450mm
 - Software: A3200

Low Density Materials

- Capabilities to produce foams and aerogels to specific requirements.

Medium Rep-rate technologies

- Array based foam target production and thin and ultra-thin targets.

MEMS Fabrication

Access to the latest fabrication technologies for mass-produced targets. Examples includes micro-dots, thin foils, spokes and indents fabricated in large numbers for statistical studies.

- Spin-coating.

Various spin-coaters, including **Laurell WS-650-8B**, with capability to spin substrates up to 300mm.

- Optical Lithography.
 - **Süss MA6/BA6 Mask Aligner.** G-line, i-line and broadband optical exposure tool with resolution down to 1 μm . Topside and backside, sub-micron alignment. Capable of exposures on wafers up to 6-inches (150mm) diameter.
- Deep Silicon Etch (DSiE).
 - **Oxford Instruments PlasmaPro 100 Estrelas.** Bosch and Cryo DSiE processes available allowing vertical and tapered sidewall profiles on wafers up to 100mm diameter. Etch depth >500 μm .

Cryogenic Targetry

- 2D cryogenic target system for low rep rate studies

Gas Targetry

- Gas filled targets for low-rep rate experiments.

Phase Plates

- Capabilities to produce phase plates up to 300mm diameter which can be used to transform the shape and intensity profile of a focused laser beam. Wavelengths from 200nm to 1900nm. Anti-reflection (AR) coatings can be applied to these optics to reduce the loss of transmitted energy and to eliminate unwanted, potentially harmful, back-reflections.

Metrology Facility

Bruker (Veeco) Wyko NT9300 White Light Interferometer

- 6" motorised x-y stage with stitching capabilities
- Motorised tip/tilt adjustment with automatic capability
- 1.25x -100x magnification through 3 objectives (2.5x, 10x, 50x) and 3 FOV magnifiers (0.5, 1, 2)
- Resolution of <1 μm in x-y
- Resolution sub nm in z.
- VSI and PSI scanning modes available
- Thick film measurement software (>1 μm)
- Extensive analysis software including auto levelling and 3D plots.

Zeiss Axio CSM700 Confocal Microscope

- 10x, 50x and 100x objectives (interchangeable with Zeiss M1m)
- True colour topology
- Step heights from 20nm to 1mm
- Surface roughness measurements, layer thickness determination, and volume, angle and contact ratio measurements.
- Z stack measurement

Zeiss M1m Axio Imager

- 2.5x, 5x, 10x, 20x, 50x and 100x objectives (interchangeable with CSM700)
- Bright-field, dark-field, polarised light and differential interference contrast imaging available.
- Transmitted and reflected light.
- Motorised and programmable x,y and z stages.
- Z-stack imaging and stitching (manual and automatic)

- Powerful image capture and analysis software for measurement, particle analysis etc

Alpha Step IQ Linear Surface Profiler

- 1-10,000um linear scan length
- Height range 400um
- Resolution of 0.01um with appropriate isolation
- Manual x-y stage

Bruker (Veeco) diCaliber Atomic Force Microscope

- Compact portable AFM
- Scans up to 90 x 90µm with a 10µm Z range
- Closed loop x-y scanning and built in x-y translator.
- Contact and tapping mode
- Powerful analysis software
- Isolated anti-vibration table allowing sub-nm resolution.

OGP SmartScope Zip 250

- 250mm x 150mm x 200mm stage
- TTL laser attachment
- HR camera for imaging
- Powerful software for 3D measurement
- CAD output
- sub-um stage resolution
- White light (transmitted, reflected ring light) or red LED ring illuminator

Bruker Skyscan 1272 Micro CT Scanner

- Working resolution up to 1um, can be improved with phase-contrast enhancement to reach sub-micron resolution
- Maximum scanning diameter of 75mm. Integrated micro positioning stage
- 2D/3D analysis, surface and volume rendering
- 16Mp CCD coupled to scintillator

PEMTRON PS-230AL Variable Pressure SEM

- 3nm resolution with appropriate isolation conditions
- 20x - 300,000x magnification (7000x optimal focus)
- Column voltage 0.5-30KeV
- TXYZ eucentric stage
- IR chamber camera
- EDX analysis software
- Backscatter electron detector
- Internal Chamber Dimensions: 148 x 190 x 145mm (W x D x H).

Optical Microscopes

- 3 x Zeiss SV11 Stereo microscopes for micro-assembly and inspection (6x - 66x magnification)
- Zeiss Stereo discovery v12 microscope with image analysis, automated focus and zoom (8x - 100x magnification)