Equipment

Foundry and Production Service

AMO runs a class 10 to class 1000 cleanroom with a total area of 400 m²: Here, high end fabrication equipment for semiconductor technology is operated in a highly flexible way to enable high quality nanofabrication, quick process changes and unconventional solutions.

Electron Beam Lithography

- Raith - EBPG 5200, Single line resolution ~10 nm, dense line resolution ~25 nm, overlay down to ~10 nm depending on markers, substrate and resist, 8" wafers

Photolithography

- Semi-Automatic Mask Aligner / EVG - 420, 2 µm resolution, 6" wafers
- i-Line Stepper / Canon - FPA 3000 i5+, 0.5 µm resolution, only 6" wafers
- Automatic Resist Coater and Developer / EVG - 150, AZ MiR701, Primer, AZ5214E, 8" wafers
- Automatic Resist Coater and Developer / SÜSS MicroTec - RCD8, dedicated to Imprint and IL-resists, 8" wafers
- Interference Lithography system, 180 nm – 2.5 µm pitch; stitching free gratings, 8" wafers

NIL - Nano Imprint Lithography

- Soft UV Nanoimprint Lithography Prototype System / EVG - 620, 6" wafers
- SCIL UV Nanoimprint Lithography System / SÜSS MicroTec - MA8 Gen3, SCIL 2"- 8", 8" wafers

Cleaning

- Wet Bench for Imprint Processes / Arias, Wet bench right (class C), carrier left (class B), 8" wafers
- Lithography Wet Bench / Arias, Single wafer, batch and samples; cleaning and resist processes, 8" wafers
- Standard Cleaning / Arias, Single wafer and batch; cleaning processes, 8" wafers

Thermal Processing

- Dry Oxidation Furnace / Centrotherm, up to 300 nm, up to 200x6" or up to 50x8" wafers per run; 15x15 cm tray for samples
- Wet Oxidation Furnace / Centrotherm, up to 2 µm, up to 200x6" or up to 50x8" wafers per run; 15x15 cm tray for samples
- Low Pressure Chemical Vapour Deposition Furnace / Centrotherm, Polysilicon; 620 °C; SiH_4 process; up to 500 nm, up to 25 wafers per run; 15x15 cm tray for samples
- Low Pressure Chemical Vapour Deposition Furnace / Centrotherm, Stochiometric Silicon Nitride (Si_3N_4); 770°C; SiH_2Cl_2 and NH_3 process; up to 500 nm, up to 25 wafers per run; 15x15 cm tray for samples
- Low Pressure Chemical Vapour Deposition Furnace / Centrotherm, LTO (low temp. SiO_2); 425 °C; SiH_4 and O_2 process; up to 500 nm, up to 25 wafers per run; 9 samples (max. 2x2 cm)
- Rapid Thermal Annealing Tool / Jipelec - JetFirst, up to 1100°C; process gases H_2, N_2, Ar, 6" wafers

Thin Film Deposition (PVD)

- DC and RF Sputtering Tool / Von Ardenne - CS730, Cluster sputter system; DC and RF; Materials: W, Ni, Ti, TiN, Al, AlSi, AlCr, SiO_2, Ta_2O_5, Al_2O_3, HfO_2, etc.; DC side can be heated up to 350 °C; process gases: Ar, N_2, O_2, 6" wafers
- Sputtersystem - Creavac Creamet500s, Single Wafer System, DC and RF; Materials: Au, Ti, TiN, Al, AlSi, SiO_2, Al_2O_3, etc.; process gases: Ar, N_2, O_2, 8" wafers
- E-Beam and Resistive Evaporator / FHR Star 200 EVA, Single Wafer System; Materials: Au, Ti, TiN, Al, AlSi, SiO_2, Al_2O_3, etc.; process gases: N_2, 8" wafers
- E-Beam and Resistive Evaporator / Pfeiffer Vacuum - Classic 580, Materials: Al, Cr, SiO_2, Ti, Ta_2O_5, etc.; process gases: N_2, O_2, 6" wafers
- PECVD / Oxford instruments, Depostion of graphene/graphite; up to 200 mm; plasma-enhanced (up to 850 °C, up to 3000 W) or thermal (up to 1200 °C); process gases: Ar, H_2, O_2, CH_4, 8" wafers

Atomic Layer Deposition

- ALD / Oxford Instruments - FlexAL, Process: Al_2O_3, AlN, TiO_2, TiN, 8" wafers
- ALD / Oxford Instruments - Atomfab, Process: Al_2O_3, AlN, 8" wafers

Contact
Dipl.-Ing.
Herbert Kleinjans
services@amo.de

AMO GmbH
Gesellschaft
für Angewandte
Mikro- und Opto-
elektronik mbH
Otto-Blumenthal-
Straße 25
52074 Aachen
Germany

Phone
+49 241 88 67-125
www.amo.de

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Dry Etching

- Inductively Coupled Plasma Reactive Ion Etcher / Oxford Instruments - PlasmaLab System 100, ICP-RIE; automatic system; mainly chlorine and bromine based chemistry; process gases: HBr, Cl_2, CHF_3, O_2, N_2, Ar, 6" wafers
- Inductively Coupled Plasma Reactive Ion Etcher / Oxford Instruments - PlasmaLab System 100, ICP-RIE; automatic 2 system; mainly chlorine and bromine based chemistry; process gases: HBr, BCl_3, Cl_2, C_4F_8, CHF_3, CF_4, SF_6, O_2, N_2, Ar, He, 6" wafers
- Inductively Coupled Plasma Reactive Ion Etcher / Oxford Instruments - PlasmaLab System 100, ICP-RIE; automatic system; mainly fluorine based chemistry; process gases: HBr, BCl_3, Cl_2, C_4F_8, CHF_3, CF_4, SF_6, O_2, N_2, Ar, He, 8" wafers
- Microwave Plasma Etcher / Tepla - Semi 300, batch and single wafer processes; O_2 and CF_4 processes, 6" wafers

Characterization

- Scanning Electron Microscope / ZEISS - Supra 60VP, 8" wafers
- Ellipsometer / Philips - PQ Ruby, Wavelengths: 632, 1301 and 1541 nm; automated mappings, 8" wafers
- Spectr. Ellipsometer / J.A. Woollam, Spectral ellipsometer for UV-Vis wavelength, single wafer processing, 6" wafers
- Optical Microscope / Leica - INM 100, Optical microscope; image capturing, 6" wafers
- Optical Microscope / Leica - INM 300, Optical microscope; image capturing, 8" wafers
- Atomic Force Microscope / Veeco - Dimension 3100, High resolution STM, AFM, MFM, 6" wafers
- Atomic Force Microscope / Bruker Icon AFM, Scan Range: (100x100) µm² down to (500x500) nm² (recommended), up to 1024 pixels, surface topography scan, electrical measurement, conductive measurement, KPFM, magnetic measurement, specific applications requires specific probes, 8" wafers
- Spektrometer / Bruker - Lambda 1050, Spectral range: 200 - 2500 nm, transmission and reflectance, max. 10x10 cm², min 3x3 cm² (2x2 cm² possible with holder), 10x10 cm²
- Raman-Spectroscopy System / Horiba, 3 wavelength 532 nm, 633 nm, 785 nm, 50x & 100x objectives, confocal setup, single points, 2D, 3D, 6" wafers
- Surface Profiler / Veeco - DekTak³ST, z-resolution ~20nm, vertical range 100A-1310kA,
- High Temperature Electrical Probe Station / Cascade Microtech, Agilent, Cascade Microtech semi-automatic probe station; High end Parameter analyzer for small signal DC nanoelectronic device testing; Agilent Precision impedance analyzer (4294A); Agilent Semiconductor parameter analyzer (4156B); Agilent pA-meter (4140B); Agilent Precision LCR-meter (4284A); high temperature chuck up to 300 °C, 8" wafers
- Lakeshore CRX-6.5 Probe Station, Temperature Range 6K-350K, 3 and 4 DC probe needles, 2" wafers
- Lakeshore CRX-6.5 Probe Station, Temperature Range 10K-650K, 3 DC probe needles, optical fiber, 2" wafers
- Optical Measurement Setup, Silicon Photonics device testing; @1300 nm and 1550 nm; tunable laser; fiber & butt coupled, 8" wafers
- RF-Lab, Electrooptical device testing; DC and RF, 8" wafers

Contact
Dipl.-Ing.
Herbert Kleinjans
services@amo.de

AMO GmbH
Gesellschaft
für Angewandte
Mikro- und Opto-
elektronik mbH
Otto-Blumenthal-
Straße 25
52074 Aachen
Germany

Phone
+49 241 88 67-125
www.amo.de

AMO