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MEMS manufacturing capability

With our state-of-the-art cleanroom, we support you from pre-feasibility studies to small and medium series production of MEMS. Our team of experienced and dedicated people ensures you a long-term relationship

We combine rigorous industrial practices with flexibility and innovative spirit

Our capability at a glance

- 700 m^2 clean room class ISO5
- 150 mm state-of-the-art tools
- Working on Si, SOI, Fused Silica, Glass, SiC, YSZ, and other specialty substrates
- ISO9001:2015 and ISO 140001:2015 certified

Lithography

Process	Equipment	Comments
Positive resist coating (manual)	Süss Microtech RCD8 coater / hot plate module	Dedicated to positive resist 0.8 µm to > 50 µm thickness
Negative resist coating (manual)	Süss Microtech RCD8 coater / hot plate module	SU8, PI, BCB
Positive resist coat and develop cluster	Süss Microtech Gamma60	Cassette to cassette prime, coat EBR & BSR, bake and develop system
HMDS vapor primer	Genesis 2020	
Contact aligner 1:1	Süss Microtech MA6/BA6	Front to back side align. Bond aligner capability
Contact aligner 1:1 automatic	Süss Microtech MA150E	Fully automatic aligner with front side to back side capability
Developing resists	Ramgraber wet bench	Manual bathes. Several SRD systems for rinse and dry
Bake ovens	Heraeus UT6060	Several of them

Furnace processing and CVD

Process	Equipment	Comments
Oxydation wet and dry	Horizontal Tempress TS8604/TS6303	Several tubes. Tmax: 1150°C. 1 x SiC tube, Tmax: 1250°C
LPCVD Polysilicon	Horizontal Tempress TS8604	Polysilicon doped or undoped. P-doped gas processes
LPCVD Silicon nitride	Horizontal Tempress TS6603	Low stress and stoichiometric Silicon nitride. Deposition on pre-structured substrates as encapsulation possible for some metals (eg. Pt)
POCl3 deposition	Horizontal Tempress TS8604	$POCl_3$ process
LPCVD Ta2O5	Horizontal Tempress TS6303	
Annealing processes	ATV Annealing furnace	
Rapid Thermal Annealing	Unitemp RTP-150-EP-HV	High Vacuum Rapid Thermal Process furnace with heating rate up to 150 K/s. Max. temp. 1200°C. N_2, forming gas and O_2 lines
PECVD deposition SiO_2, Si_xN_y, SiON, a-Si, TEOS	SPTS APM cluster tool	Many recipes silane based, stress and refractive index control, TEOS deposition at temperature < 170°C
Atomic layer deposition	Oxford FlexAL	Al_2O_3, ZnO:Al, Pt. Other materials on request Remote plasma option
Molecular Vapor deposition	Applied MST	Organic & Inorganic layers from 1 to 500 nm
Parylene deposition	Comelec C25	Parylène C, others on request

Metal deposition thin film

Process	Equipment	Comments
E-beam evaporation system	Leybold Univex 500	Cr, Au, Al, Cu, Ti, Ni, Ta, Pt, more on demand
E-beam evaporation system	EVA760 Alliance concept	See above
Sputtering	Oerlikon LLS-EVO	Batch deposition. RF etch and degas. DC and RF sputtering. Co-sputtering and reactive sputtering. Deposition T° up to 300°C. Al, AlSi, Cu, Ti, TiW, Ta, TaN, TiN, Cr, Ag, Al_2O_3, Mo, Pt, Au, Black Cr. More on demand
Sputtering	Oerlikon Clusterline 300	AlN, ZnO, … Highly doped AlScN (>10% Sc)

Dry etching

Process	Equipment	Comments
Silicon Deep reactive ion etching (DRIE)	SPTS Rapier cluster	Cassette to cassette cluster tool. Etch depth >600 µm. Verticality <0.1°. Smooth sidewalls. End point detection
Silicon and oxide deep reactive ion etching (DRIE)	Adixen AMS200	Cassette to cassette. End point detection
ICP etcher	Corial 210 IL	Oxide, fused silica, SiC, glass etching Metal etching: Al, Cr, Pt, AlN, .. Liner system for each process family to avoid cross-contaminations
RIE etcher	Alcatel GIR263	SiO_2, SiN and Si etching in fluorine chemistry
Downstream plasma stripper	Muegge STP2020	SU8 stripping system
Resist stripping (Barrel etcher)	Tepla Gigabatch 360	
Resist stripping (Barrel etcher)	Tepla PVA300	

Wet etching

Process	Equipment	Comments
Wet etching metals	Ramgraber wet bench	Cr, Al, Cu, Au, Ti, …
Wet etching dielectrics	Ramgraber wet bench	HF, BHF, H_3PO_4
Wet etching silicon	Ramgraber wet bench	KOH, TMAH
Cleaning processes	Ramgraber wet bench	RCA1, RCA2, Nanostrip, HNO_3, BHF, Piranha, …
HF vapor etching	Idonus systems	SiO_2 etching for structures release
Wet stripping processes	Ramgraber wet bench	Lift-off tool, NMP, Iso-2
Several spin rinser dryers	Ramgraber and semitool	

Electroplating

Process	Equipment	Comments
Au plating	CSEM custom design	Au electrodeposition in molds up to > 300 µm
NiP plating	CSEM custom design	NiP electrodeposition in molds up to > 300 µm
Cu plating	CSEM custom design	Other materials available on request

Wafer bonding

Process	Equipment	Comments
Anodic, adhesive, eutectic and thermo-compression bond	Süss Microtech SB6L	Alignment capability < 5 µm. Au/Au, Cu/Cu, Pt/Pt thermo-compression, other materials on request
Anodic, adhesive, eutectic and thermo-compression bond	EVG520is	Dual chamber semi-automated wafer bonder with alignment capability < 5 µm. Heating up to 550°C, vacuum and high pressure options, 60 KN force

Metrology

Process	Equipment	Comments
Optical microscopes	Zeiss, Nikon, …	Several of them
CD measurement system	Nikon NM40	
Automatic CD meas. system	MicroVu 251	
Step height measurement	KLA-Tencor Alphastep P7	Extended range up to 1 mm
White light interferometer	Wyko	
Film thickness measurement	Nanocalc	
Ellipsometer	Woolmann Alphas SE	
Automatic mapping resistivity measurements	AIT CMT SR2000 4 point prober	Semi-automatic system
Stress measurement	Tencor FLX-2320A	
Wafer bonding inspection	Idonus WBI 200	Pre/post bonding alignment check
IR microscope	Idonus IRM 150	
Digital microscope	Keyence VAX-1000E	
Scanning electron microscopy	FEI Quanta 650	150 mm wafers
Dual beam FIB/SEM	FEI Scios 2	
FTIR spetrometer	Bruker Vertex 70	
Prober manual	Süss Microtech PM5	
Prober semi-automatic	Süss Microtech PA200	Thermo-chuck -30°C – +200°C

Machining

Process	Equipment	Comments
Automatic dicing SAW	DISCO DAD3350	
Diamond turning	LT Ultra MMC900	Surface rectification after electroplating. Thickness control down to the micron