

## OCTOPLUS 300 / MBE SYSTEM

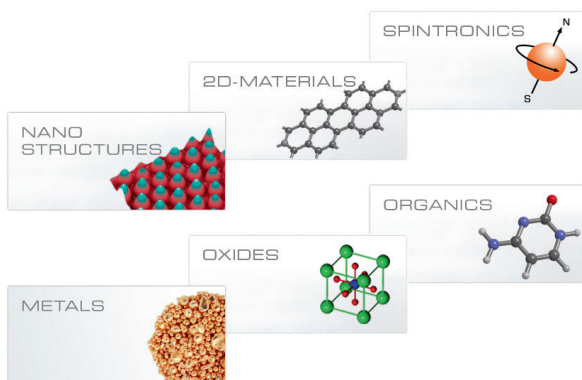
- Compact research MBE system with low energy and liquid nitrogen consumption
- Applications for many materials, e.g., semiconductors, metals, oxides, organics
- Up to 9 source ports
- Sample size: 10x10 mm<sup>2</sup>, 1" or 2" wafers
- < 5x10<sup>-11</sup> mbar base pressure
- Stainless steel LN2 cooling shroud
- In-situ monitoring



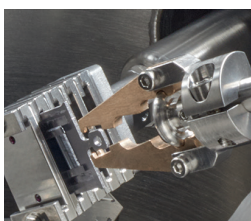
OCTOPLUS 300 MBE System

OCTOPLUS 300 is an MBE system with quite small footprint. Despite its small size it still includes the main features needed for high quality MBE layer deposition.

The very compact research MBE system allows deposition of atomically thin and precisely defined layers of materials, such as metals, magnetic materials, Si, Ge, GaAs, phosphides, antimonides, nitrides, graphene, topological insulator layers, etc.



Fields of application for OCTOPLUS 300



View into buffer chamber:  
pincer reaching for flag style  
sample plate.

OCTOPLUS 300 is equipped with an LN2 cooling shroud surrounding the substrate manipulator, up to nine main source ports, as well as ports for in-situ analysis like RHEED, quartz microbalance, beam flux monitor and/or pyrometer.

The source ports can be equipped with single or dual effusion cells, EBVV e-beam evaporators, rod-type e-beam evaporators, or valved sources.

OCTOPLUS 300 includes a load lock and optionally a buffer chamber with small sample transfer for UHV analysis or into a UHV suit case.

The substrate holder allows sample heating up to 1200°C as well as cooling close to LN2 temperatures. A special option enables deposition under defined sample tilt angle.

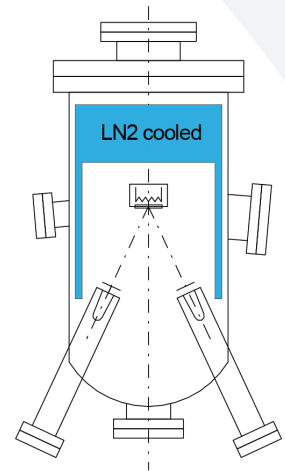
The MBE process control software integrates easy recipe writing, automated growth control and data recording.

All products of Dr. Eberl MBE-Komponenten are designed and manufactured by our UHV / MBE experts. The products are cleaned and assembled in our own clean room environment.

Each component is tested and outgassed under UHV conditions. Helium leak testing and operation of each component at maximum temperature are performed to reach the high standard of our products.

### Technical Data

Size of deposition chamber	300 mm I.D.
Base pressure	$< 5 \times 10^{-11}$ mbar
Pumping	turbopump, ion getter pump and TSP
Cooling shroud	LN2 or water cooling
Substrate heater temp.	up to 1200°C
Substrate size	small sample plates or up to 2" wafers
Bakeout temperature	up to 200°C
Source ports	9 ports DN40CF (O.D. 2.75") or 8 ports (2x DN63CF (O.D. 4.5"), 6x DN40CF)
Source types	effusion cells, e-beam evaporators, sublimation sources, valved cracker sources, gas sources
Shutters	soft-acting rotary shutters
In-situ monitoring	ion gauge, QCM, pyrometer, RHEED, QMA
Sample transfer	linear transfer rod (manual)
Load lock	turbo-pumped; magazine with 6 substrates
MBE control software	Tusker
Service	installation and acceptance testing
MBE training	by PhD MBE experts



Schematic illustration of deposition chamber

### Examples for applications and corresponding sources

Application	Effusion Cells	Sublimation Sources	Valved Sources	Plasma Sources	E-Beam Evaporators
Source type	WEZ, NTEZ	SUKO, SUSI	VACS, VGCS		EBVV or EFM3
OME, HTEZ		HTS, DECO	VCS, VSCS		
III/V	Ga, In, Al	C, Si doping	As, P, Sb		
II/VI	Zn, Cd, Be		S, Se, Te	N-doping	
IV	Ge, Sn, Pb	B, P, Sb doping			Si, Ge
GaN	Ga, In, Al			N	
Metals and Magnetics	Cu, Au, Ag, Al, Ni, Co, ...	Ti			Pt, Ta, Pd, Mo, W, ...
Topological Insulators	Ge, Sb, Te, Bi, GeSb		Se, Te		B
Graphene / Silicene		C, Si			
Oxides	Fe, Ni, Mn, Bi, Eu, Ga, ...			O	
Thin Film Solar Cells	Cu, Ga, In, Zn,		S, Se		

### MBE components typically used in OCTOPLUS 300:



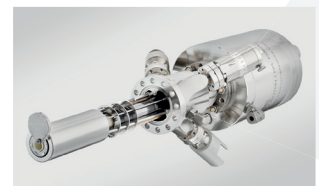
Effusion cell 2 to 10 cm<sup>3</sup>,  
high temperature cell



Source Cluster,  
e.g., Dual Cluster Source



EBVV E-Beam Evaporator,  
EFM3 or rod type e-beam



Thermal Cracker Cell TCC  
or Gas Injector Source