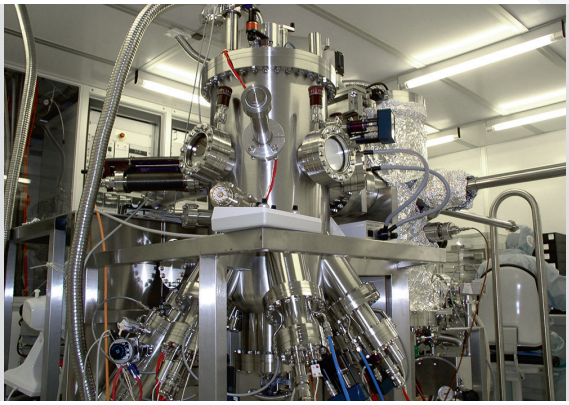
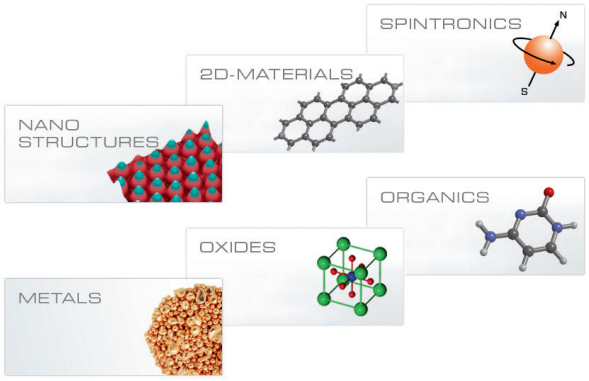
MBE
KOMPONENTEN | DR. EBERL

OCTOPLUS 300 / MINI MBE SYSTEM

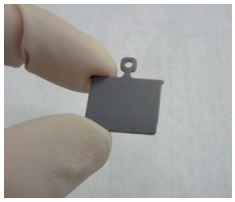
- Small samples or up to 2 inch substrates
- Substrate heating – cooling
- Substrate rotation and tilt
- LN2 cooling shroud
- $5x10^{-11}$ mbar base pressure
- Load-lock and access to UHV analysis
- 8 source flanges, 10 sources possible
- RHEED, Quartz, pyrometer etc.
- E-beam evaporator



Octoplus 300 MBE System



Fields of applications for Octoplus 300



Small sample plate
substrate adapter
compatible to surface analysis tools

The Octoplus 300 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.

The Octoplus 300 is a really small footprint MBE system. Despite its small size it still includes the main features for high quality MBE layer deposition.

The MBE chamber is equipped with an LN2 cooling shroud surrounding the substrate manipulator, eight 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 or rod-type e-beam evaporators, or valved sources.
The Octoplus 300 includes a load-lock and optionally a buffer chamber with optional 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 perfomed to reach the high standard of our products.

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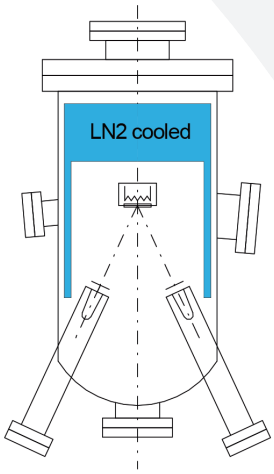
Technical Data

Size of deposition chamber	250 mm
Base pressure	< $5x10^{-11}$ mbar
Pumping	turbo pump, 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
Sources	8 source flanges (2x DN63CF, 6x DN40CF)
Source types	Effusion Cells, E-Beam-Evaporators,
	Sublimation Sources, Valved Cracker
	Sources, Gas Sources
In-situ monitoring	ion gauge, quartz, pyrometer, RHEED, QMA
Sample transfer	linear transfer rod (manual)
Load-lock	turbo-pumped; magazine with 6 substrates
MBE control software	EpiSoft
System installation and	included
acceptance testing	
MBE training	by MBE expert



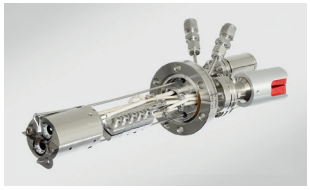
Schematic illustration
of deposition chamber

Examples for applications and corresponding sources

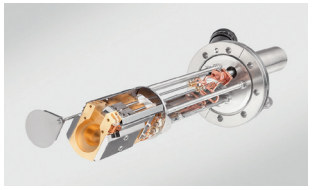
Application	Effusion	Sublimation	Valved	Plasma	E-Beam
	Cell	Source	Source	Source	Evaporator
Source type	WEZ/NTEZ	SUKO, SUSI	VACS, VGCS		EBVV
	OME/HTEZ	HTS, DECO	VCS, VSCS		or EFM3
III/V (As, Sb, P)	Ga, In, Al, Be	C, Si doping	As, P, Sb		
II/VI	Zn, Cd, Be		S, Se, Te	N-doping	
IV	Ge, Sn, Pb	B, P, Sb doping			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,		Se, Te		B
	Bi, GeSb				
Graphene / Silicene		C, Si			
Oxides	Fe, Ni, Mn, Bi,			O	
	Eu, Ga,…				
Thin Film Solar Cell	Cu, Ga, In, Zn,		S, Se		

MBE Components typically used in Octoplus 300:

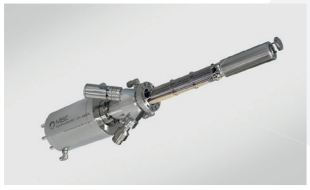
Knudsen cell 2 to 10 cm^3,
high temperature cells



Source Cluster,
e.g., Dual Effusion Cell



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



Thermal Cracker Cell TCC
or Gas Injector Source

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