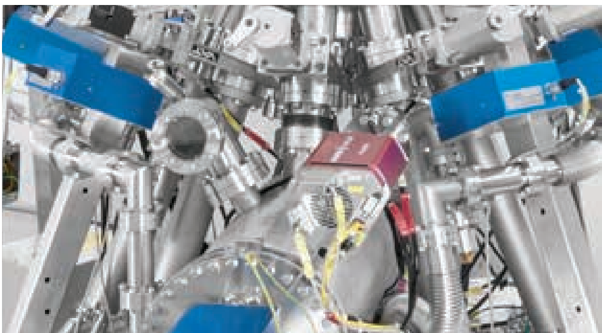
MBE KOMPONENTEN | DR. EBERL

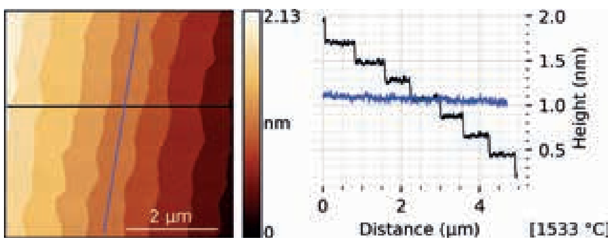
OCTOPLUS-O 400 / OXIDE MBE SYSTEM

- Oxide MBE system with efficient differential pumping
- Applications: growth of oxides and metals
- 9 source ports for effusion cells, multi-pocket e-beam evaporators, etc.
- Small samples or wafer sizes up to 2“
- Ozone-resistant SiC substrate heater or CO2 laser substrate heating

OCTOPLUS-O 400 Oxide MBE System



A multi-pocket electron beam evaporator EBVM is attached to the chamber via a space-saving 4.5 inch (DN63CF) flange.



Clearly shaped atomic layer growth in oxide environment on Al_2O_3 substrate heated by CO2 laser.
(Courtesy of Prof. J. Mannhart, MPI-FKF Stuttgart)

CO2 laser substrate heating: Many oxide substrates absorb CO2 laser light strongly, allowing substrate heating up to more than 1400°C. An additional backside metal coating is not necessary.
(Courtesy of Prof. J. Mannhart, MPI-FKF Stuttgart)

Elaborately designed for oxide layer deposition, the compact OCTOPLUS-O 400 MBE system stands out due to its unique design, high reliability and versatility. These features make it particularly suitable for research, development, and specific small-scale production processes..

The standard version of the OCTOPLUS-O 400 comprises 9 source ports (extendible to 12 ports) with 4.5 inch (DN63CF) flanges. Various source options including multi-pocket electron beam evaporation (see figure on the left) enable a wide range of applications. Optional in-situ monitoring devices (see table on the backside) complete the system configuration.

The special chamber design in combination with an effective differential pumping allows depositing oxide layers under high oxygen or ozone partial pressure, while the hot sources remain secure from significant degeneration. A circumferential ring pumping system additionally protects the hot parts of the cells and allows the withdrawal of each individual cell without breaking the chamber vacuum.

A rapid pump-down load lock chamber with horizontal transfer rod facilitates the introduction of substrates into the system. The face-down substrate positioning as well as the adaption to small wafer segments or full 2 inch wafers can be easily accomplished.

Substrate heating by a SiC heater or by CO2 laser heating (see figures on the left) allow layer by layer precise MBE growth.

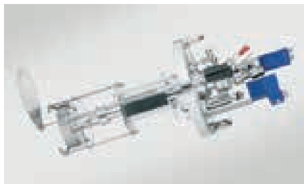
Technical Data

Size of deposition chamber	450 mm I.D.
Base pressure	< 5×10^{-11} mbar (depends on pumping system)
Pumping	cryopump, turbopump, TSP or ion getter pump
Cooling shroud	LN2 or other cooling liquids on request
Substrate heater temperature	up to 800°C, 1000°C, or 1400°C
Substrate size	up to 2" diameter
Bakeout temperature	up to 200°C
Source ports	9 source ports DN63CF (O.D. 4.5")
Source types	effusion cells, e-beam evaporators, sublimation
	sources, valved cracker sources, gas sources
Shutters	soft-acting linear or rotary shutters
In-situ monitoring	ion gauge, QCM, pyrometer, RHEED, QMA
Sample transfer	linear transfer rod, manual or semi-automatic
Load lock	turbo-pumped, magazine with 6 substrates
MBE control software	Tusker
Service	system installation and acceptance testing
MBE training	by PhD MBE experts

Examples for applications and corresponding sources

Application	Effusion	Sublimation	Ozone	Plasma	E-Beam
	Cells	Sources	Sources	Sources	Evaporators
Source type	WEZ, NTEZ,	SUKO, SUSI	O3S		EBVV, EBVM
	HTEZ	HTS, DECO			
Oxides	Fe, Ni, Mn, Bi,	C	Ozone	O	Ir, La, Ni, Ru, Mo, Ta,
	Eu, Ga, ...				W, Nb, ...

MBE components typically used in OCTOPLUS-O 400:


Substrate Manipulator

Effusion Cell

Multi-pocket E-Beam Evaporator

Ozone Source

Dr. Eberl MBE-Komponenten GmbH
Josef-Beyerle-Str. 18/1
71263 Weil der Stadt, Germany

Fon +49 7033 6937-0
Mail info@mbe-components.com
Web www.mbe-components.com