

MiniMBE System

Extremely compact design scaled for perfect homogeneity on 15 mm diameter samples



Highlights

- Optimized pumping configuration
- Integrated LN₂-cooling shroud for cells and chamber wall
- Different substrate heater options
- Up to 11 effusion sources with 2cm³ capacity
- CF 63 central multifunctional port (standard sources, e-beam, and plasma source)
- Linear shutter
- Flux gauge, QCM, RHEED, ellipsometry, pyrometer
- Automated batch processing with cVac software

CreaTec designs and manufactures complete MBE Systems for the preparation of epitaxial films (semiconductors, metals, dielectrics and organics) and wafers for various scientific applications. The MiniMBE System is specially designed for epitaxial growth on small sample sizes in combination with a reduced size of the system. The system consist of the growth chamber for growing layers by MBE and a load-lock chamber.

The growth chamber contains effusion cells, manipulators, cooling units, transfer to the load-lock chamber, pumping equipment and other necessary instruments. The pumping is done via Turbo-Molecular Pump (TMP) and Ion Pump with getter pump, due to the required process specification. The load-lock chamber is equipped with the transfer units to the MBE chamber. It contains a transfer rod for sample transfer, fast loading door, BA-gauge, etc. The pumping is done with a TMP.

The samples are mounted on flag-style sample holders for wafer sizes of 10 mm x 10 mm, while other customized wafer sizes can easily be adapted. The samples are loaded on the transfer rod of the

TYPE	MINI MBE SYSTEM	
SIZE	200 CF 250 CF	growth chamber
PRESSURE	< 5 x 10 ⁻¹¹ mbar	
COOLING SHROUD	LN2 around manipulator and/or evaporators	
SUBSTRATE HEATER TEMP.	up to 1200 °C 1400 °C	with e-beam
SUBSTRATE SIZE	small sample plates or wafers	(e.g 10 x 10 mm)
BAKE-OUT TEMP.	up to 200 °C	
LOAD-LOCK	turbo-pumped	
SAMPLE TRANSFER	linear transfer rod	
CONTROL SOFTWARE	cVac	
CHAMBER DIAMETER	206 mm 256 mm	
FLOOR SPACE	1250 mm x 1650 mm	
HEIGHT TRANSFER PLANE	1200 mm	others on request

load-lock chamber. A bake-out lamp, integrated into the Load-lock chamber helps to quickly remove residual water.

The complete system is mounted on a stainless steel frame. The bake-out system consists of a heating system that covers the complete system. It allows the bake-out of all chambers controlled by a power supply with temperature. The complete electronic equipment is stored in 19" racks. A bolt-on version of the system can be mounted to an existing UHV system to increase the number of possibilities for scientific investigations of the wafers.

Equipment for MiniMBE



Evaporators



Manipulators



Linear Shutter Edge



Transfer Rod



Monitoring

- Pyrometer
- RHEED System
- Beam Flux Monitor
- Quartz Crystal Monitor
- Mass spectrometer
- Pressure measurement



Pumping

- Turbo pump
- Ion pump
- Getter pump

cVac | Control Software



The CreaTec Control Software is a software package for control, monitoring and automation of MBE and UHV systems.