

# Growth Systems

CreaTec implements complex customer requirements, including MBE Systems for special materials and Transfer Systems



MiniMBE System



Growth System with Linear Transfer



# Growth Systems | Research

CreaTec has more than 20 years of experience in construction, design and manufacturing of UHV equipment. This allows us to implement complex customer requirements in MBE and evaporation systems, also for special materials and with automatic transfer systems. All systems are assembled under Class 10 cleanroom conditions. Superior system components are used to guarantee high quality and reliability. CreaTec provides solutions for all kind of physical vapor deposition (PVD) applications.

## **High quality standard**

- UHV-compatible with base pressure better than  $5 \times 10^{-11}$  mbar in the growth chamber
- High sample temperature and excellent film thickness uniformities
- Ready for use after installation on site

## **Growth chamber**

- Up to 12 effusion cell ports
- Heatable manipulator with continuous rotation (cooling option on request)
- High efficient cooling shroud encircling the effusion cells and the manipulator
- Pumping configuration adaptable for each application
- Monitoring with QCM, BFM, RHEED, etc.

## **Load-lock chamber**

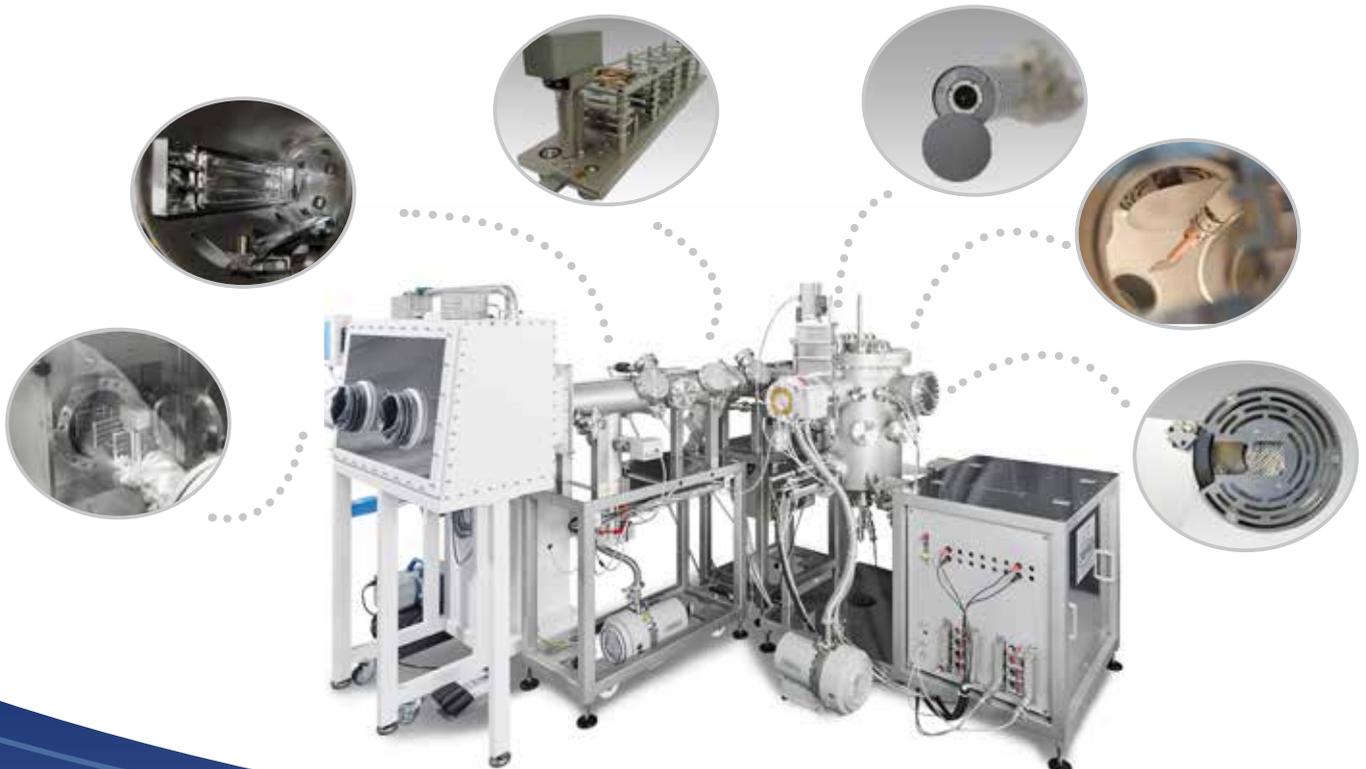
- Sample transfer
- Loading door
- Turbo molecular pump with roughing pump
- Glove box upgradable
- Heating lamp

## **Transfer chamber**

- Sample transfer on a trolley
- Transfer rod for transfers into the specific chamber
- Expandable

## **Miscellaneous**

- Cabinet housing all required controllers
- Complete bake-out system
- Mounted on a stable rack
- Expandable with further UHV equipments
- cVac software control



# Linear Transfer System

The Linear Transfer is a system to connect several experimental stations in order to create a flexible and expandable instrumentation for in-situ preparation, analysis, storage and growth of layers without removing the samples from the UHV environment during different processing steps. The sample transfer is performed by a trolley and transfer rods.

## Main Features

- Linear transfer chamber and load-lock chamber
- Combination of different kinds of in-situ analysis, growth and preparation methods
- Linearly expandable in all directions
- UHV compatible down to  $10^{-11}$  bar

**Transfer rod** for sample transfer from the trolley to the connected chamber



**Fast loading door** in load-lock chamber. Heating station to remove water



**Mechanical feedthrough** connected to a central rail inside the chamber. Adjustable from air-side in two directions



**Trolley** runs on rail inside the chamber. Driven by external magnets or mechanical feedthroughs



# RTA System

*Rapid Thermal Annealing System  
for a wide range of applications*

The RTA System is used for rapid thermal annealing of wafers either in UHV or other atmospheres like oxygen or nitrogen, with a variable pressure range up to atmospheric pressure. The wafer is heated by an array of high-power quartz lamps. A gas handling system can be installed to provide an exactly defined gas pressure level in the reaction chamber. During the RTA process, this atmosphere can be analyzed with a quadrupole mass spectrometer.

TYPE	RTA-CT
TEMPERATURE RANGE	100 - 800 °C (optional 1000 °C)
HEATING RATE	1 - 100 °C/sec
TEMPERATURE STABILITY	± 5% (edge excluded)
MAX. WAFER SIZE	Up to 4 inch or as specified
COOLING	Water
HEATING ELEMENTS	Quartz lamps
THERMOCOUPLE	Type C
PRESSURE RANGE	1000 - 10 <sup>-9</sup> mbar



**Quartz heater lamp** array adapted in size to the processed wafer. Several quartz lamps are regularly spaced within a cooling system.

## Shuttle System

Shuttle systems are used to move samples from one system to another under true UHV conditions. By making use of an intermediate pumping chamber the shuttle is docked to the UHV system with the samples to be transferred.



A **shuttle system** contains UHV chamber, transfer rod, pumping system and gate valve.

## Other available chambers

- Analysis chamber
- Preparation chamber
- Heating chamber with integrated heating modules
- Storage chamber with customized storage tools