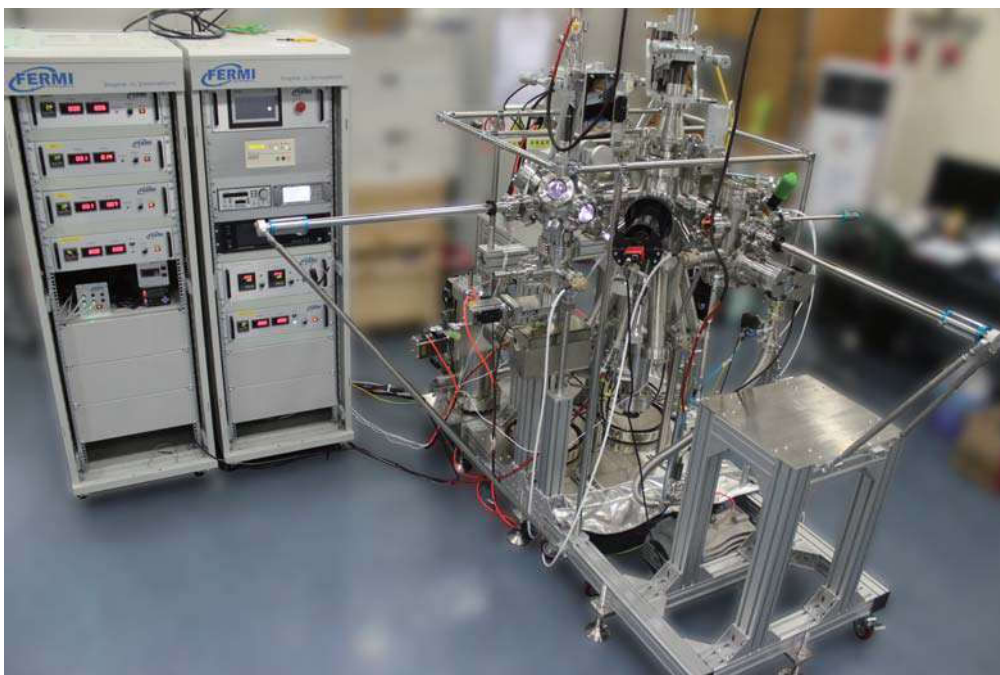


## Section 8. Complex Systems



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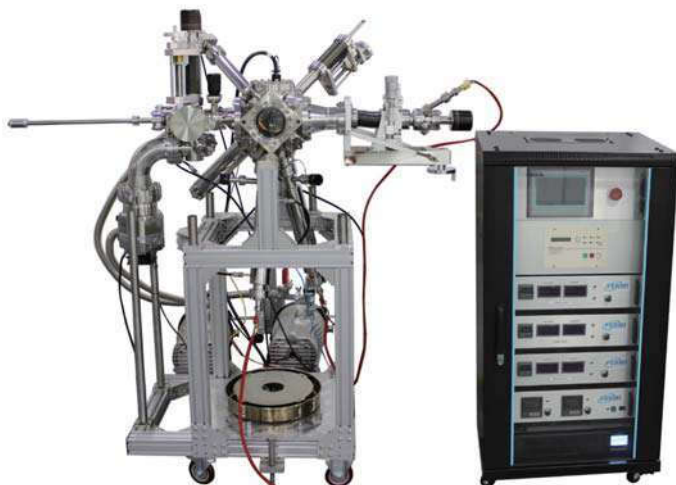
- 8.1 Cubic-200 MBE System
- 8.2 Medium Size MBE System
- 8.3 Full Size MBE System
- 8.4 Radial Distribution Sample Transfer System

## Section 8. Complex Systems

Fe Se Mn Cu Ge Ag In Sb Ba Au Te Pb Bi Sm ...

### Cubic-200 MBE System

#### Highlights



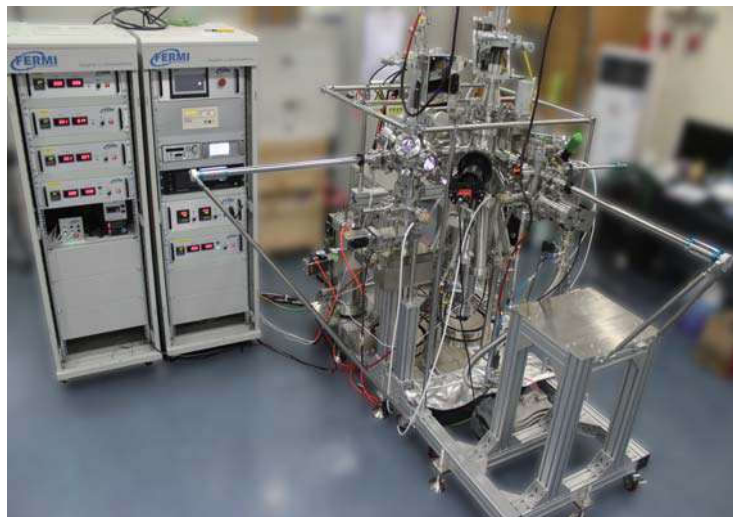
- Chamber is made from one piece of SS316
- No welding part, guarantees the lowest possibility of leaking
- DN100CF, x 6  
DN40CF flanges, x 8
- 300L/s Turbo Pump and oil-free scroll pump
- QCM (Inficon or K.J. Lesker) with linear shift
- Wide range gauge (or Ion gauge)
- 4-axis manipulator with temperature controller

| Specification      | Basic   | Upgrade Option  |
|--------------------|---|---|
| Chamber            | Made from one piece of SS316  | Ti Alloy available  |
| Flanges            | DN40CF: 8; DN100CF: 6;  | DN40CF: 8; DN100CF: 4;<br>DN150CF: 2;   |
| Turbo Pump         | Pfeiffer HiPace 300   | Edwards STP301 Mag-Lev TMP  |
| Forevacuum Pump    | Edwards nXDS6i  | Edwards nXDS10i   |
| Base Pressure      | <5E-10 mbar   | <5E-10 mbar<br>(or additional Ion Pump/NEG/TSP,<br>base pressure up to 5E-11 mbar)                          |
| 4-axis Manipulator | X/Y( $\pm 8$ mm), Z(75mm), $\theta$ ( $\pm 180^\circ$ )   |   |
| Temperature Range  | RT~1200K  | Liquid Nitrogen Cooling Module;<br>E-beam Heating Module  |
| QCM                | INFICON STM-2<br>100mm Linear Shift   | INFICON XTC/3s<br>100mm Linear Shift  |
| Evaporator         | Evaporator: 2 sets<br>Temperature Range : 80-1500°C<br>Temperature Stability : $\pm 0.1^\circ\text{C}$<br>Flange : DN40CF<br>Crucible Volume : ~10cc<br>Manual Shutters and Water Cooling | Up to 7 Evaporators<br>Temperature Range : up to 2000°C<br>Pneumatic Shutters with Controller &<br>Software |
| Gate Valve         | HTC DN63CF Manual Gate Valve  | VAT DN63CF Manual Gate Valve  |
| Other Accessories  | Load Lock, Sample Transfer, High Stability Chiller  |   |

## Section 8. Complex Systems

La Sr Mn Cu Bi Ba Au Y Ni Ti Ru Nb Ca Ir ...

### Medium Size MBE System



- SS316 UHV Chamber, NW CF Standard
- Base Pressure better than  $5.0 \times 10^{-10}$  mbar  
Improvable with optional Pumps
- Up to 12 ports for evaporators, compatible with all commercial products.
- 4-axis manipulator support flag type sample holder, resistance/e-beam/dc heating, LN2/ He cooling, 4 Probe options.
- Extension Flange Available for In-Situ Characterizat

|                    | Specification   |
|--------------------|---|
| Chamber            | Made from SS316 , fully UHV compatible  |
| Pumps              | <b>Standard:</b><br>Edwards STP 603 Mag- Lev Turbo Pump with nXDS 10i Dry Pump<br><b>Optional:</b><br>TSP, LN2 Trap, Ion Pump, NEG Pump, 2nd stage Turbo Pump                         |
| Base Pressure      | <5E-10 mbar (Standard)  |
| 4-axis Manipulator | X/Y( $\pm 8$ mm), Z(150mm), $\theta$ ( $\pm 180^\circ$ ) , Heating /Cooling on request  |
| QCM                | Retractable INFICON XTC/3s controller and Front Load Single Sensor  |
| RHEED              | STAIB 15 KeV RHEED & Phosphor Screen; CCD & Software for Data acquisition and analysis  |
| Evaporator Cells   | Up to 12 Evaporators :<br>4 x CF 40 Ports @ 18 degrees<br>4 x CF 63 Ports @ 20 degrees<br>4 x CF 40 Ports @ 55 degrees<br><br>Pneumatic Shtters with Controller Box & Recipe Software |
| Gate Valve         | VAT DN63 CF UHV Manual Gate Valve   |
| Other Accessories  | Load Lock, UFO Chamber , Ion source, LEED Chamber<br>ARPES/XPS/STM Connections  |

## Section 8. Complex Systems

La Sr Mn Cu Bi Ba Au Y Ni Ti Ru Nb Ca Ir ...

### Full Size MBE System



|                          | Specification  |
|--------------------------|--|
| Chamber                  | Made from SS316 with UHV standard  |
| Pumps                    | Edwards STP1003 Mag-Lev Turbo Pump, EXT75DX turbo pump as the second stage backing pump and differential pumping, nXDS10i as the forevacuum pump;<br>TSP with Liquid Nitrogen Cooling Shroud   |
| Base Pressure            | <1E-10 mbar after 48 hours bakeout at 150 °C   |
| 4-axis Manipulator       | X/Y(±8mm), Z(150mm), $\theta$ (+/-180°)<br>Temperature Range: Liquid Nitrogen Cooling Module, 150~1200K  |
| QCM                      | INFICON XTC/3s with 150mm Linear Shift   |
| RHEED                    | STAIB 15 KeV RHEED & Phosphor Screen; Data acquisition and Analysis.   |
| High Purity Ozone System | High purity Ozone source, up to 90% purity; capable to oxidize most material at 1E-6 mbar Ozone atmosphere; Max 16 g/hour Ozone generation capability and storage of 8g liquid Ozone (supporting up to 8 hours of growth process).                 |
| Evaporator Cells         | Up to 16 Evaporators<br>Temperature Range : up to 2000°C (with K-cells)<br>up to 3000°C (with E-beam Evaporator)<br>Temperature Stability : $\pm 0.1^{\circ}\text{C}$<br>Flange : DN40CF / DN63CF<br>Pneumatic Shutters with Controller & Software |
| Gate Valve               | VAT DN63/40CF UHV Manual Gate Valve  |
| Other Accessories        | Load Lock, RDC, High Stability Chiller   |

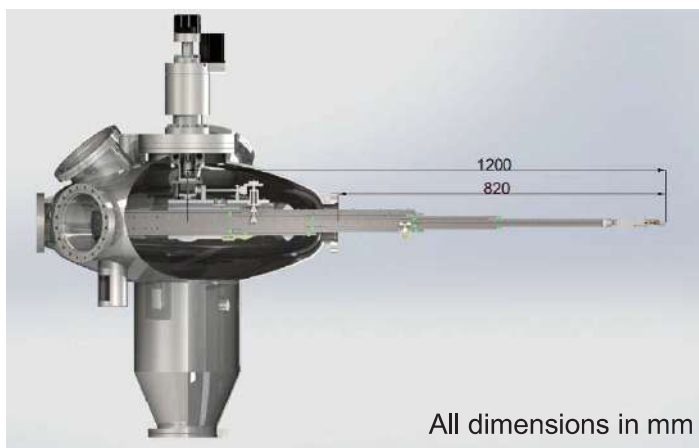


## Section 8. Complex Systems

### Radial Distribution Sample Transfer System

#### Highlights:

- The sample transfer mechanism and sample transfer chamber has been approved by the **China Patent No.:** 201520801219.1
- Base pressure:  $10^{-11}$  mbar
- Optimized mechanical structure and materials guarantee less degassing
- Extension capability: up to 8 sub-systems;
- Stroke: 820mm (measured from the port edge), the longest one in the market;
- Motorization upgradable



|                            |                       |
|----------------------------|-----------------------|
| Chamber Size               | 700mm Diameter        |
| Mounting Flange of Arm     | CF200                 |
| Maintenance Flange         | CF150                 |
| Connecting Flange          | CF100                 |
| Rotation of Transfer Arm   | 360 degree continuous |
| Extending Stroke           | 820mm                 |
| Maximum arm length         | 1200mm                |
| Rotation accuracy          | <0.1 degrees          |
| Highest baking temperature | 150°C                 |
| Maximum load               | 1 kg                  |

This Radial Distribution Sample Transfer System is hosted in a UFO shaped chamber and thus normally mentioned as UFO system. The chamber is in UHV standard and made from SS316. UFO Chamber is very important in multi-purpose system as it will connect different systems as one piece and samples can travel freely in UHV environment and could be measured in-situ. Up to 8 sub-systems could be connected to the UFO system. This UFO Assembly is equipped with cutting-edge transfer mechanism and the transfer arm could extend longer than the diameter of the chamber (820 mm from the port edge). This extension is useful and thus sub-systems could sit further away from the UFO and leave more space for operation and system expansion.