Vacuabond

Vacuum System Design

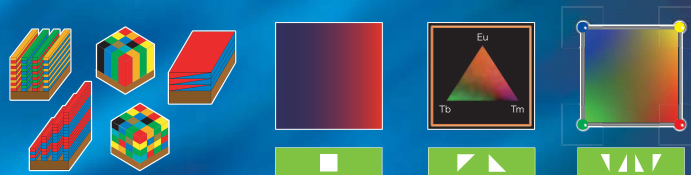
UHV / Vacuum Systems & Components

LASER MBE & COMBINATORIAL DEPOSITION SYSTEM

Combinatorial Deposition System

Innovative system drastically accelerates R&D speed of Solid State Materials and Devices

Combinatorial system enables you to fabricate integrated nano-structured chips and molecular-layer composition-spread library on a single substrate, Simultaneously, Synchronously and Automatically.
Speed up and cost reduction at once by rapid and effective screening.



Typical Combinatorial Film and Mask Pattern

Mobile Combi

Compact Laser MBE

Combinatorial Mask Mechanism
Laser Substrate Heating System

View of Laser Ablation

Laser Substrate Heating System

Innovative Laser Diode (LD) heating system is ideal for high pressure Oxygen and Nitrogen process. LD substrate heating system realizes rapid temperature control up to 1,200℃. Laser optics can optimize heating area and prevent unnecessary heating-up of substrate holder and other mechanics. No high temperature heater is inside of vacuum, so it can keep vacuum condition clean.

Compact RHEED System featured with Differential Pumping & Beam Scanning

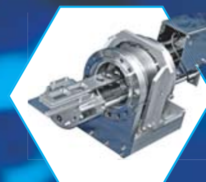
One and two stage differential pumping types are available for operation under high vacuum pressure. Downsizing with keeping high performance (30kV maximum) and stability. CF34, CF70 or CF114 mounting. Optional e-Beam Scanning mechanism enhance flexibility. Oscillation Monitoring system is also available.

Component Line-up

Laser Diode Substrate Heating, Rotation & Combinatorial Mask

UHV - Halogen Lamp Substrate Heating & Rotation

Target Rotation & Revolution (up to six targets)



Combinatorial Mask Moving Mechanism

RHEED System

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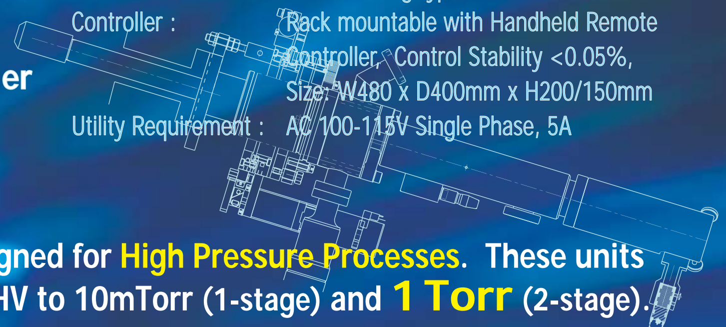
RHEED System & UHV System Integration

Model ARH-100 RHEED System

Filament :	Tungsten Hairpin
Acceleration :	30kV max., 0 to 30 kV Variable
Wehnelt Bias :	Self-bias
Electron Optics :	Magnetic Field Focusing, Molybdenum Single Aperture (Exchangeable)
Beam Deflection :	X-Y +/- 5 deg., Magnetic Field Defrection
Beam Size :	PY 0.3mm or less
Baking Temperature :	180 ℃ max.
Axis Adjustment :	Mechanical Fine-adjustment Mechanism (2 Stage Differential Pumping)
Installation Flange :	CF34: Standard Gun Body and 1 stage Differential Pumping type CF70: 2 Stages Differential Pumping and Scanning type
Controller :	Rack mountable with Handheld Remote Controller, Control Stability <0.05%, Size: W480 x D400mm x H200/150mm
Utility Requirement :	AC 100-115V Single Phase, 5A

Features

- High Performance (30kV max.) and Stability
- Ultra Compact Electron Gun (CF34 Mount)
- UHV Design
- Safety Design, Stable Power Supply & Controller
- Higher Process Flexibility with many options



DIFFERENTIAL PUMPING

One- & Two-stage Differential Pumping units are designed for High Pressure Processes. These units allow ARH-100 RHEED system operation range from UHV to 10mTorr (1-stage) and **1 Torr** (2-stage).

ELECTRON-BEAM SCANNING

Electron Beam Scanning mechanism enhance process flexibility.
Enhanced scanning allows wide area monitoring on a substrate.
This option can be combined with One -stage Differential Pumping.

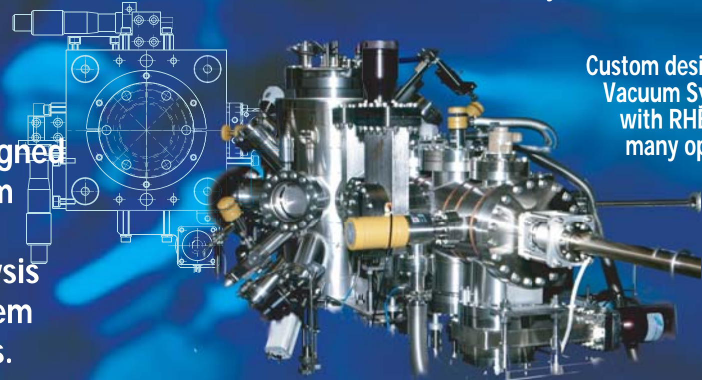
Scanning & Differential Pumping RHEED System (CF70 Mount)

OSCILLATION IMAGE PROCESSING & RHEED ACCESSORIES

Complete oscillation monitoring system, RHEED Screen & Shutter (CF70, CF152, CF203) and the Retractable & Moving Screen Mechanism for the system integration.

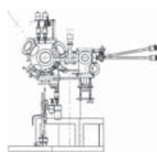
System Integration

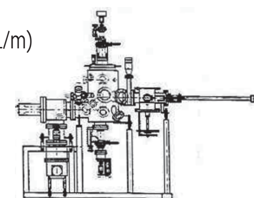
We integrate this RHEED system on our pre-designed vacuum chambers that are optimized for thin film deposition and analysis purposes.
We also custom-design the Deposition and Analysis vacuum systems combined with the RHEED system for your processes and any specific requirements.



Custom designed Vacuum System with RHEED & many options

Pascal Laser MBE & Combinatorial Deposition System





	Mobile Combi	Compact Laser MBE
Growth Chamber	PY 260mm Spherical, SUS304, Electro-polished	PY 300mm Cylindrical, SUS304, Electro-polished
Base Pressure :	2×10^{-9} Torr or less	2×10^{-9} Torr or less
Pumping System :	TMP (320L/s) and Roughing (250L/m)	TMP (800L/s) and Roughing (250L/m)
Baking System :	On/Off Control, Maximum Baking Temperature 250 ℃	<
Gas Inlet System :	Variable Leak Valve w/ Nozzle, MFC (optional)	<
Laser Inlet:	CF114 Synthesized Quartz Window, Optical system (optional)	<
Control System :	Lab View™ Automatic Combinatorial Process Controller or PC-Sequencer Recipe Control System.	
	Stand alone control racks for Remote & Electro Manual Operation.	<
Utility :	AC200V Three Phase 40A & AC100-115V Single Phase 40A	AC200V Three Phase 50A & AC100 Single Phase 40A
	Integrated utility panel and manifold for Process gas, HVAC, Vent N2 and Cooling Water	
Load Lock	PY 100mm Cylindrical, SUS304, Electro-polished	PY150mm Cylindrical, SUS304, Electro-polished
Base Pressure :	5×10^{-7} Torr or less	<
Pumping System :	TMP (80L/s) and Roughing (950L/m)	<
Baking System :	On/Off Control, Maximum baking Temperature 150-250 ℃	<
Sample Storage :	Substrate x 2, Target x 2 on Rotation / Elevation Stage	Substrate x 2, Target x 4 on Rotation / Elevation Stage
Transfer System :	Magnetic Coupling Transfer System for Substrate & Target Exchange	<
	Adjustable X-Y Transfer Position, Bakable UHV Rod w/ Tilting Mechanism	Adjustable X-Y Transfer Position, Bakable UHV Rod
Separation Valve :	CF114 UHV Gate Valve	CF152 UHV Gate Valve
Exchange Door :	CF114 Door w/ Viewing Port (Top Loading)	CF152 Door w/ Viewing Port (Top Loading)

Substrate Heating & Rotation System

	Halogen Lamp Heating	Diode Laser Heating
Holder Size:	PY 1" or 2" (Inconel)	PY 1" or 2" (Inconel), Substrate max. 10mm sq.
Holder Adjustment :	X-Y (adj. for Transfer position) and Z (+/- 20mm)	<
Heating System :	1" or 2" Halogen Lamp Heating	Laser Diode Heating (808nm, 140W)
Temperature :	Programmable PID Control from 200 ℃ to 800 (1,000) ℃	< Range from 140 ℃ to 1,400 ℃
Holder Rotation :	AC Motor Driven, Remote Control	Stepping Motor Driven, Remote Control
Shutter :	Built in shutter for Pre-ablation, Manual Operation	<

Target Rotation & Revolution System

Holder Size & No. :	PY 20mm x 4 or 6 (optional) (PY25mm size is available on selected system)
Target Shield :	Built-in, prevent from cross-contamination, only one target exposed.
Moving System :	Target Rotation : AC Motor Driven (0-20 rpm), Exchange Rotation : Stepping Motor Driven, Remote Control
Adjustment :	X axis : +/- 10mm, Y axis : +/- 10mm, Z axis : +/- 20mm
T-S Distance :	50 mm +/- 20mm (typical)

RHEED System

One and Two stages Differential Pumping types, e-Beam Scanning type and Patter Processing System are available.

Filament :	Tungsten Hairpin
Acceleration :	30kV max., 0 to 30 kV Variable
Wehnelt Bias :	Self-bias
Electron Optics :	Magnetic Field Focusing, Molybdenum Single Aperture (Exchangeable)
Beam Deflection :	X-Y +/- 5 deg., Magnetic Field Defrection
Beam Size :	PY 0.3mm or less
Baking Temperature :	180 ℃ max.
Axis Adjustment :	Mechanical Fine-adjustment Mechanism (2 Stage Differential Pumping)
Installation Flange :	CF34: Standard Gun Body & 1 stage Differential Pumping type, CF70: 2 Stages Differential Pumping & Scanning type
Controller :	Rack mountable with Handheld Remote Controller, Controller Stability <0.05%, Size: W480 x H200/150 x D400mm
Utility Requirement :	AC 100-115V Single Phase, 5A
Options :	**Screen & Shutter** : Fluorescence Material P-1 (P-47) on Transparent Conductive Coated Glass, Size for CF70, 152 & 203
	Differential Pumping Unit : One (max. 10 mTorr) and Two stages (max. 1 Torr) Differential Pumping
	Oscillation Image Processing Unit : Resolution 500 x 500 plus, Video Capturing max. 3,600 shots in 1sec. Interval
	Oscillometry : 4 points sampling, 2 points background sampling, max. 1,000 cycles

Vacuum System Design
We custom-design UHV & XHV Systems.
Please contact us for your requirments.

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