

AUTO 500 VACUUM COATING SYSTEM



THE MULTI-PURPOSE DEPOSITION SYSTEM FOR RESEARCH & DEVELOPMENT

Auto500 is a versatile front-loading coating system with box chamber for research & development or pre-production applications. The chamber accommodates large diameter substrates and allows a range of resistance evaporation, electron beam and sputter processes to be performed without breaking vacuum.

The front-loading chamber is mounted on a pedestal which also houses the vacuum system. A rugged PLC is used to control the vacuum system while a full-height 19" equipment rack places the PLC screen and process accessory controls within easy reach of the operator.

The Auto500 can be configured with a single source or for multiple sources of different types to provide the user with great versatility. The system can be upgraded with more or different accessories as requirements change.

The range of deposition sources is complemented by a range of work holders which provide for sample rotation to high-temperature heating and substrate bias.

A range of diffusion, turbo-molecular and cryo pumps is available to suit the widest range of requirements. Auto500 is also available with dry pumps for oil-free vacuum.



Features & benefits

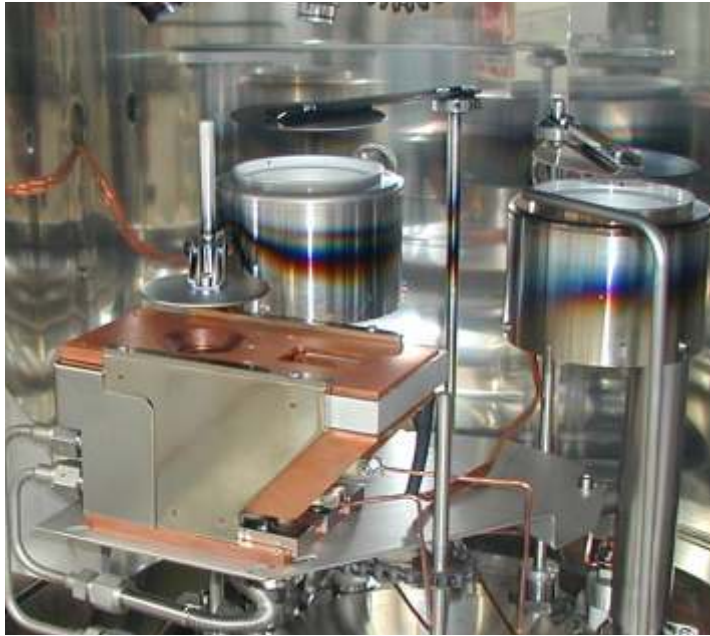
- Large box chamber (500 mm diameter x 500 mm high).
- Front loading for easy access into the chamber
- Extra feedthrough holes built into the side wall for extra process monitoring and Residual Gas Analyzers
- Standard Diffusion, Turbo, Cryo pumping options
- Rack panel provides space for thin film accessories and power supplies
- Available with a full range of accessories

Applications

- Anti-reflective coatings
- Semiconductors
- Mirrors
- Dielectrics
- Organics/polymers & OLED's
- Photonics research
- Compound semiconductors
- Solar cells
- Nanotechnology

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DEPOSITION PROCESS CAPABILITY



Interior of FL500 chamber showing EB3 electron beam source plus two 75mm magnetron sputtering sources

Auto 500 Multi-process System

The Auto 500 can be configured with a wide range of accessories for evaporation, electron-beam and sputtering or can be combined together to provide a flexible multi-process deposition system. Systems are designed and customized from a range of deposition sources, chamber sizes, and 19 inch rack cabinets to suit individual requirements.



Sputter system with three height adjustable 75 mm magnetrons



Interior of FL400 chamber showing EB3 electron beam source, two resistance sources and quartz lamp substrate heater.

Auto 500 Evaporation System

Resistance Evaporation

The HHV Auto 500 resistance evaporation system provides researchers with an affordable but capable tool that can be upgraded as required by adding more sophisticated deposition techniques.

Electron Beam Evaporation

The Auto 500 electron-beam evaporation system can deposit ultra pure films of materials with high melting points, and other materials that are difficult to deposit or control by resistance evaporation.

Fast deposition rates can be achieved using electron-beam evaporation. Electron-beam sources can hold more evaporant than resistance source, which allows the deposition of thick film, and multiple coatings before the need to refill the electron-beam source.

Auto 500 Sputtering Systems for R & D

The Auto 500 can be configured as a powerful and versatile research sputtering system. Available options include:

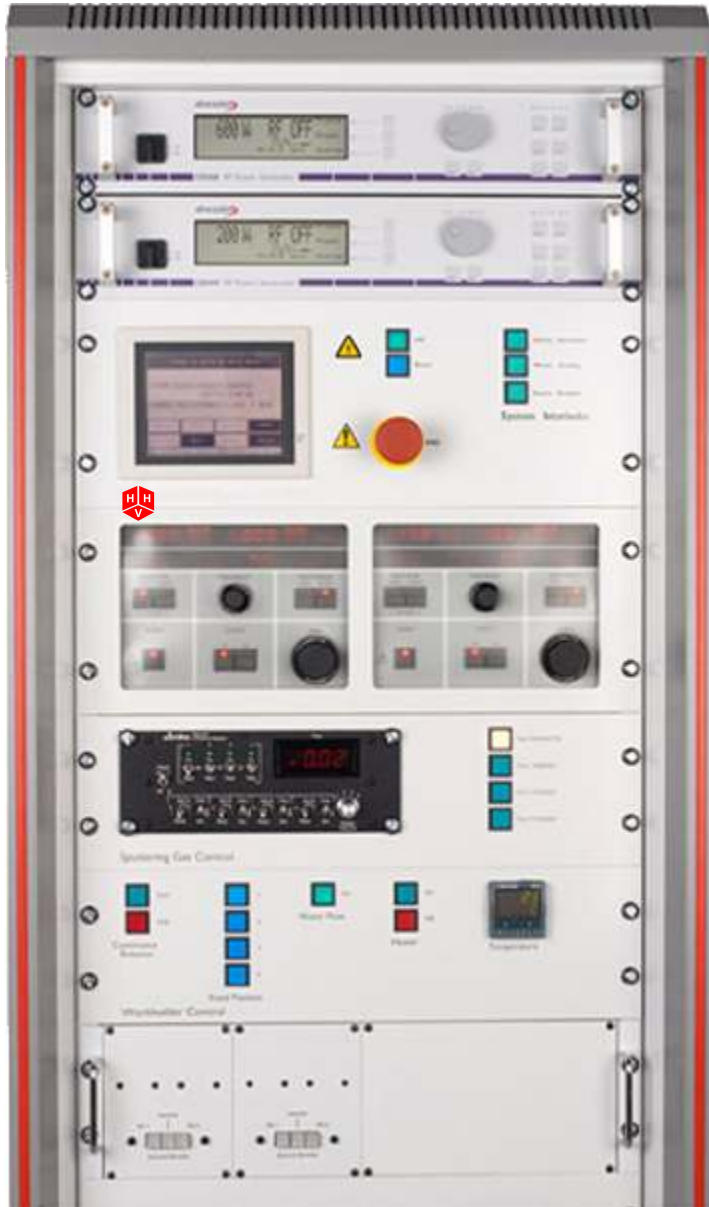
- Up to 3 magnetron sputtering sources for upwards sputtering
- Gimballed sputtering sources for focused co-sputtering
- Wide choices of vacuum chambers
- RF and DC magnetron sputtering, co-sputtering and sputter etching
- RF bias sputtering during deposition
- RF and DC power selector switches
- Reactive sputtering
- Load-lock ports and sample manipulation
- Water-cooled and RF insulated workholders
- Automatic mass flow gas control for 1, 2 or 3 process gases
- Automatic process control
- Substrate heating

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PROCESS ACCESSORIES

Vacuum Control

The Auto 500 is supplied with a PLC operated automatic vacuum control system with touch screen display as standard. The system pressures are monitored using a combination of Active Pirani and Active Inverted Magnetron gauges. Comprehensive error checking is provided in order to protect the system from incorrect operation. Full manual operation mode and diagnostics functions are provided.



Auto 500 19" rack with RF and DC power supplies, PLC system controller and mass flow controller

Process Gas Control

Sophisticated gas control systems are available for up to 3 process gases. Gas flow rates and the proportions of multiple can be preset and controlled. The control panels give a continuous digital display of the gas flow rates.



Coating chamber with load-lock assembly for two inch substrates

Sputtering Power Supplies

A range of power supplies are available in a variety of sequential and co-sputtering configurations. DC power can be used to sputter non-conductors. All RF power systems are provided with automatic tuning networks to minimize reflected power losses. Power selector switches enable power to be applied sequentially to multiple sputtering sources and the workholder.

Load-lock Ports

The Auto 500 system is offered with load-lock accessories to enable sample transfer without breaking vacuum. This feature reduces cycle time and the risk of sample contamination.

Excellent Deposition Control

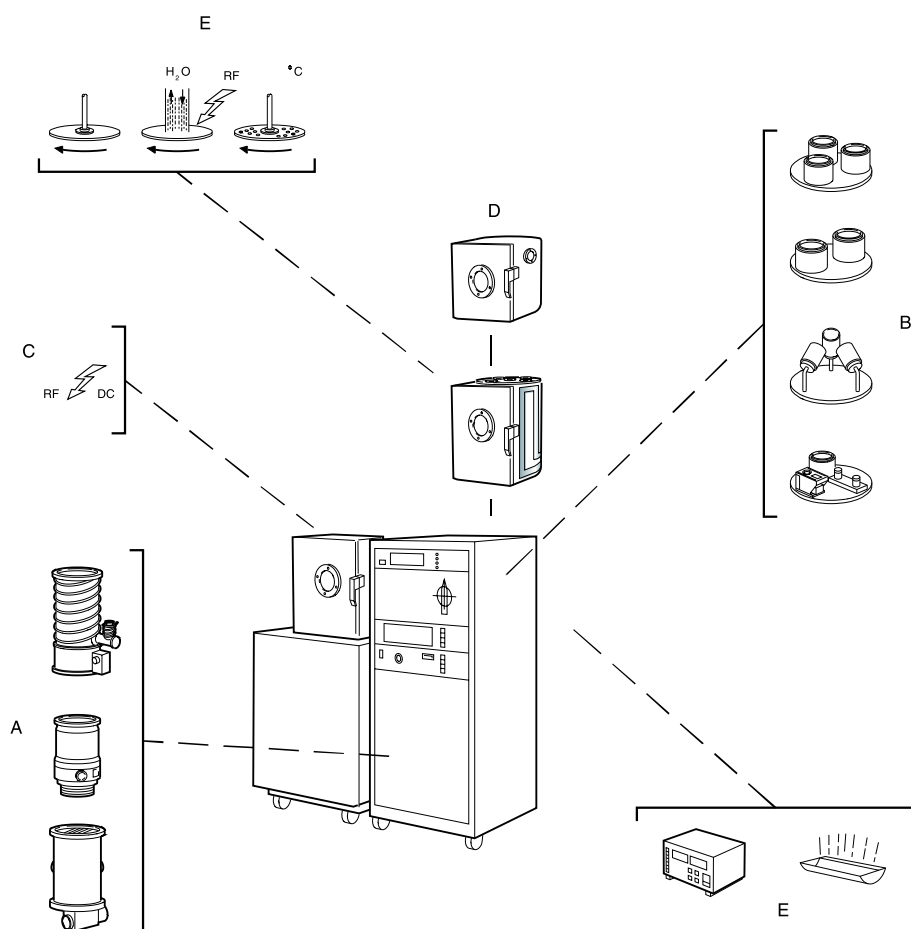
The high degree of control possible with electron-beam sources enables materials to be evaporated with constant deposition rate control. The Auto 500 can be supplied with quartz crystal deposition controllers that can be linked to the vacuum controller to provide fully automatic electron-beam process control. To provide maximum research flexibility, HHV electron-beam systems have comprehensive controls for the electron-beam source, X-Y beam sweep and turret indexing.



Eb3 Electron beam source with multiple turret options

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SYSTEM CONFIGURATION OPTIONS



A - Vacuum Pumping

- Diffusion
- Turbo
- Cryo

B - Deposition Options

- 3 sputtering sources
- 2 sputtering sources
- Focused sputtering
- Sputtering and resistance evaporation
- Sputtering and electron beam
- Resistance sources

C - Sputtering Power Supplies

- DC
- RF
- DC and RF

D - Vacuum Chambers

- FL400 front loading chamber
- FL500 front loading chamber
- Water cooled chambers
- Load-lock chambers

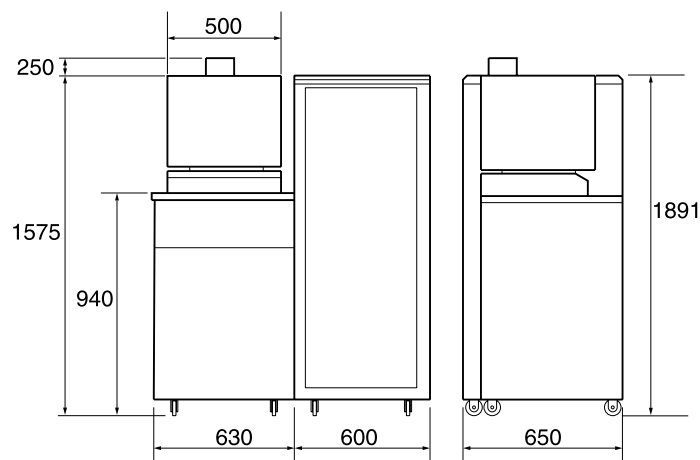
E - Additional Accessories

- Film thickness monitoring
- Heating
- Single gas control
- Multiple gas control
- Workholders

TECHNICAL DATA

FL500 Stainless steel box chamber	: 500 mm (19.7") diameter x 500 mm (19.7") high
Internal dimensions	: 433 mm (17") x 402 mm (15.8")
Viewport	: 100 mm (3.9") diameter
Chamber wall access ports	: 1 x NW25, 1 x NW38CF
Top plate access ports	: 6 x NW25
Workholder plate	
(Standard)	: 260 mm (10.25") diameter
(Maximum)	: 425 mm (16.75") diameter
Ultimate vacuum	: 7×10^{-7} mbar (5×10^{-7} torr)*
Pumpdown	
1×10^{-5} mbar (7.5×10^{-6} torr)	: <13 mins*
2×10^{-6} mbar (1.5×10^{-6} torr)	: <60 mins*
Vacuum pumping options	: 600 l/s Diffusion pump with LN2
	: 500 l/s Turbo pump with LN2
	: 1500 l/s Cryo pump

* For clean dry chamber and with liquid nitrogen trap in use



Typical Dimensions (mm)



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