

# HIGH VACUUM DEPOSITION SYSTEMS

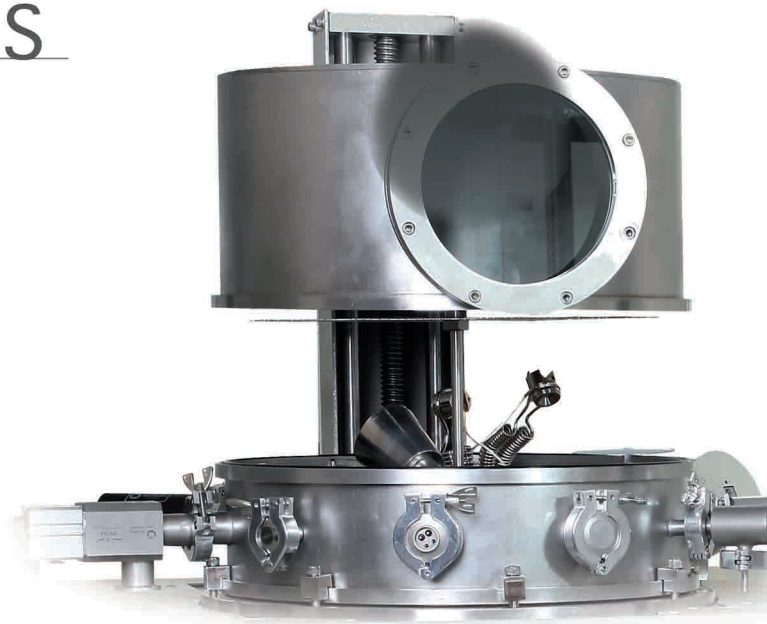


Gathering experienced scientists and technicians from several fields of engineering and putting them in an innovative and customer-first environment has given YNS Co. a unique opportunity to interact with various sectors of industry, to provide high-tech products, to manufacture special purpose equipment, and to solve lifelong problems.

**High vacuum system:** Equipment to create low pressure condition 10<sup>-8</sup> torr for special operations.

**Coating system:** Equipment for deposition thin film materials

(Insulator/Conductor/Superconductor)



## COATING SYSTEMS

YNS coating systems can be configured with a wide range of accessories for evaporation 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.

### Deposition techniques available:

- DC magnetron sputtering
- RF magnetron sputtering
- Resistive thermal evaporation

## Technical Specifications

Ultimate pressure	1×10 <sup>-6</sup> torr
Chamber	304 stainless steel chamber- Integral hoists for chamber bell jar
Ports	Eight radial process ports
Pumps	Standard Diffusion and cold trap pumping. Pumpdown times are automatically kept to a minimum.
Substrate size and temperature	Accommodates substrates up to 300mm - Substrate heating to 200° C
Sputtering source	Two magnetron sputtering sources
Film thickness monitoring	Film thickness monitoring with quartz crystal holder
Valves	high vacuum valve ( pneumatic butterfly valve), on/off valve, needle valve, purge valve
Sputtering Power	DC power supply: 800 V - 1 A
Supplies	RF power supply: Frequency 13.86 MHz - 230 watt
Thermal evaporation power supplies	100 amperes with 10 volts



## Applications

- Anti-reflective coatings
- Semiconductors
- Mirrors
- Compact disc master metallization
- Dielectrics
- Organics, polymers and OLEDs
- Photonics research
- Solar cells
- Nanotechnology

## PECVD-RIE system

This is a dual-chamber system. This system can be used for various research and industrial application. Plasma-enhanced chemical vapor deposition (PECVD) is a process used to deposit thin films from a gas state (vapor) on the different substrates. It is used for the deposition of dielectric and passivation films such as silicon oxide or silicon nitride. Reactive-Ion Etching (RIE) is one of the methods for dry etching and is used in semiconductor and superconductor devices fabrication. RIE is the combination of chemical and physical etching. This system is a simplified modification for etching semiconductors, dielectric and metal layers in capacitive discharge plasma.



### Technical Specification

Vacuum chamber	2 Cylindrical Vacuum chamber: diameter 10 inch (250mm) and length 200mm and 100mm
Vacuum pumping	Turbo pump with dual stage rotary as backing pump
Base pressure	$1 \times 10^{-6}$ torr
RF Generator	RF Generator and Automatch (AMU) with power 200w
Mass Flow Controller	4 MFC-controlled gas lines and needle valves
Maximum substrate temperatures	Maximum substrate temperatures (typ. 450° C) for PECVD
System control	PLC (Programmable Logic Controller)
Capabilities	Deposition and etching of thin films
Electrodes	Top electrode with high uniformity shower head
Etch rate	Depends on the gases and materials- adjustable
Max substrate diameter	Max substrate diameter 3 inch



### Sputter coater & thermal evaporation

Deposition Methods	Sputtering and thermal evaporating
Vacuum chamber	Cylindrical glass chamber Diameter : 300mm, Height: 200 mm
Thickness measurement system	Thickness measurement of deposited layers and rate of deposition with crystal Quartz
Magnetron sputtering Source	800 W
Evaporation source	150 amper
Max substrate size	5 inches
Base pressure	$1 \times 10^{-3}$ torr

\* This desktop coating system is a suitable unit for SEM & TEM sample preparation.

## ACCESSORIES



### Steel Vacuum Chamber

- Vacuum range  $1 \times 10^{-8}$  torr
- Finish: Glassbead blast standard
- Materials Flanges and body: 304 SS/O-rings: Viton & NBR
- Multi flange ISO-KF and ISO-K port connection
- Glass viewports



### Glass vacuum belljar

- Made from pyrex to withstand thermal shock and chemical attack
- Available in various diameters and lengths
- Features good high-vacuum properties



### Diffusion pump DP100, DP150

- Max pressure :  $\times 10^{-7}$  torr
- Speed : 250, 700 L/S



### Liquid nitrogen cold trap

- Designed to reach  $\times 10^{-8}$  torr
- Design to reduce backstreaming
- Flange size: Standard DN100



### High Current Electrodes

- Standard 1" diameter baseplate mounting
- 100 A, 50 V Max
- Water cooled
- Vacuum Range:  $1 \times 10^{-7}$  torr



### Rotary Feedthrough

- Rotary motion with magnetic and direct coupling
- Vacuum Range:  $1 \times 10^{-8}$  torr
- Standard 1" diameter baseplate mounting





**Active Vacuum Pirani gauge**

- Measurement range:  $1 \times 10^{-3}$  torr
- Vacuum range:  $1 \times 10^{-7}$  torr
- Flange size: Standard DN10



**Gauge Display**

- Compatible with pirani and cold cathode gauge
- Electrical connection: RJ45
- Temperature storage: 0-30 °c



**Cold Cathode Ionization Gauge**

- Measurement range:  $1 \times 10^{-3}$ - $1 \times 10^{-6}$  torr
- Vacuum range:  $1 \times 10^{-7}$  torr
- Flange size: Standard DN25



**Butterfly valve**

- Vacuum range:  $1 \times 10^{-6}$  torr
- Materials Flanges and body: 304 SS/O-rings NBR
- Flange Size: ISO-KF , ISO-K



**Vacuum Connection and Flanges**

- HV rated to  $\times 10^{-8}$  torr
- High temperature rated to 150 °C
- ISO compatible design
- 304 Stainless Steel
- Elastomer O-ring seal: NBR or Viton



**Needle valve and Plug valve**

- Vacuum Range:  $1 \times 10^{-6}$  torr,  $1 \times 10^{-8}$  torr
- Two DN10 ports