PECVD Systems

NANO-MASTER, Inc.

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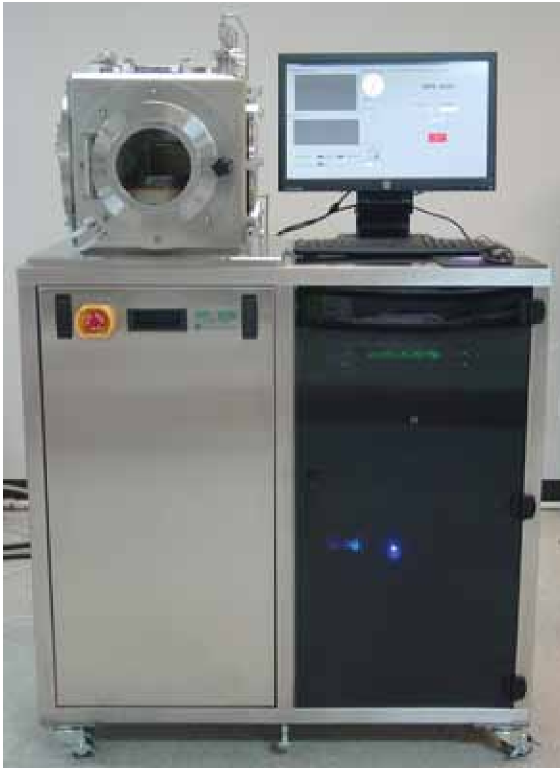
NANO-MASTER PECVD Systems



NPE-4000 for DLC

NANO-MASTER's PECVD systems are capable of depositing high quality SiO_2, Si_3N_4, CNT, DLC or SiC films on up to 8" diameter substrate sizes. Depending on applications many different plasma sources can be used which include: RF shower head electrode, Hollow Cathode RF plasma source, ICP plasma source or Microwave plasma source. Substrate platen can accommodate up to 8" wafers and can be biased with RF, Pulsed DC, or DC while being heated up to 800°C resistively or with IR lamps and cooled with chilled water. The chamber is evacuated to low 10-7 torr pressure range using 250 l/sec turbo molecular pump backed with 5 cfm mechanical pump.. The systems are automated fully with PC control.

APPLICATIONS

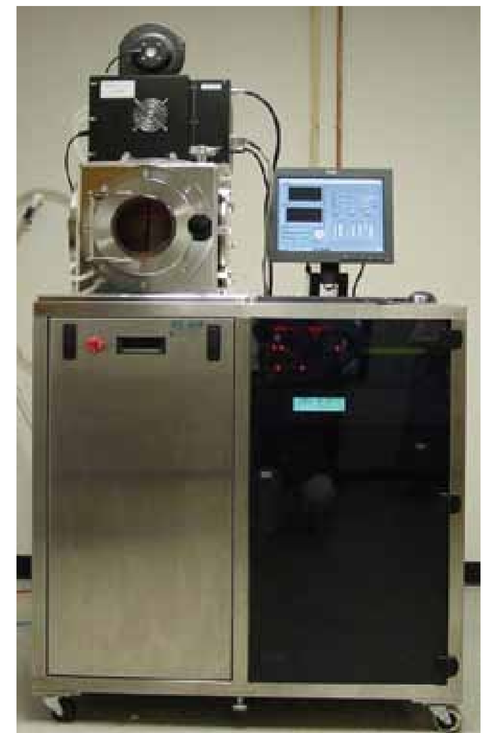
- SiOx, SiNx and SiOxNy deposition
- Amorphous Silicon deposition
- Diamond-like carbon deposition
- Photonics structures
- Encapsulation, isolation
- CNT's - Memory devices

FEATURES

- 13" Al chamber or 14" SS cube chamber
- 5 x 10^{-7} Torr base pressure attained with turbo pumping package
- RF showerhead plasma source
- Gas ring for reactive gases
- 200°C to 800°C substrate heating options
- MFC's with electro polished gas lines and pneumatic shut-off valves
- PC based fully automatic recipe or manually driven control system
- State of the art user interface
- EMO protection and safety interlocks

OPTIONS

- NM-ICP source for high density plasma
- Hollow cathode plasma source
- Microwave plasma source
- Substrate Pulsed DC bias
- Substrate LF bias for film stress control
- Rotating platen for coating 3D parts
- Auto load/unload
- Dry pump
- Bubblers for organo-metallics with heated gas lines
- Gas box for toxics gases with toxic gas monitors
- End point detection
- Various dopants (PH_3, B_2H_6)



NPE-4000 for CNT

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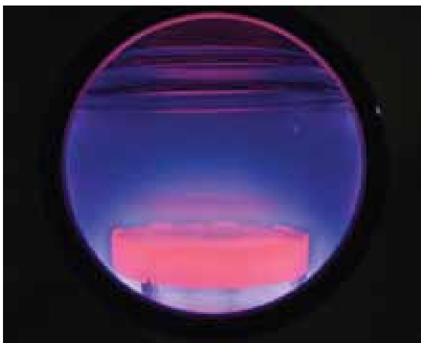
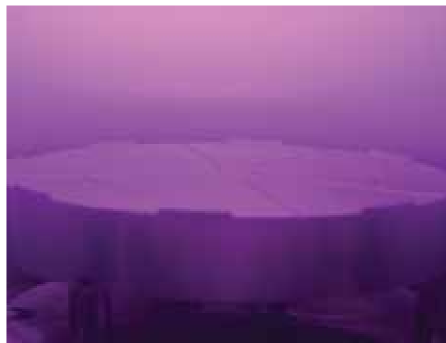
NPE-4000 for Si_3N_4
and SiO_2 Deposition

NRP-4000 Dual System
RIE/PECVD



-500 V Bias, 700 °C, ICP Off

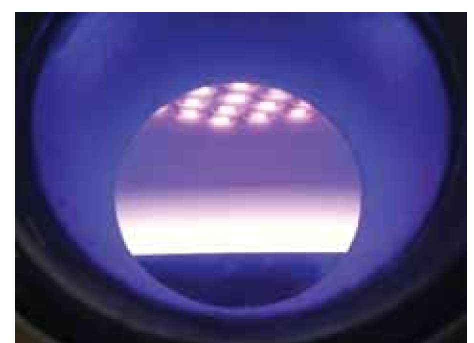


300 W RF Bias

-1000 V DC Bias, 500 °C, ICP On

700 °C, ICP On

Heated Plate with RF Bias



Hollow Cathode Plasma Source

NANO-MASTER PECVD Systems

GENERAL SPECIFICATIONS

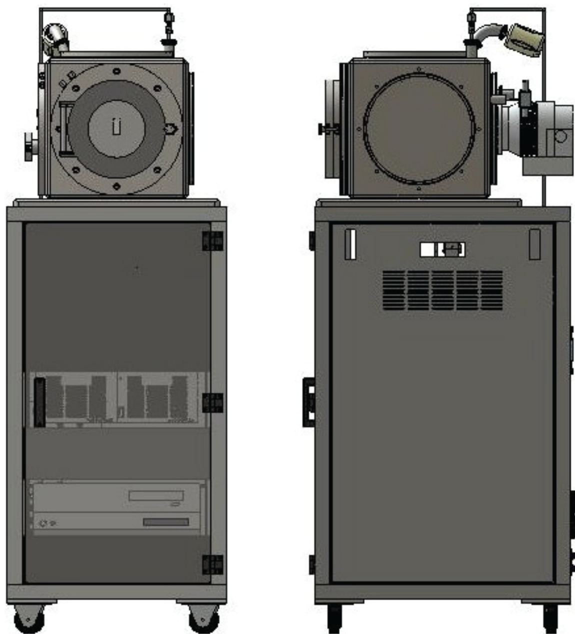
Platen Size:	Up to 8”
Plasma Source Diameter:	8” RF plate with shower head gas distribution
Number of MFC’s:	5 or up to 10 (with separate gas box)
Source to Platen Distance:	2” to 4”
Vacuum:	5 10^{-7} Torr range with 260 l/sec corrosive turbo pump with 9cfm mech.
Maximum Platen Temperature:	400°C for 8” platen, 700°C for 6” platen, 800°C for 4” platen,
RF power Supply:	13.56MHz, 600W RF for plasma source or 1KW RF supply for ICP source
LF Power for biasing the platen:	300W, 350-450KHz

FACILITY REQUIREMENTS

Power Input:	208V/380V/415V, 20A/Phase, 50/60Hz
Chilled Water:	2gpm @ 50 psi, 18°C
Compressed Air:	1/4” Swagelok, 80-90 PSI
Processed Gas:	1/4” Swagelok, 20 PSIG
Nitrogen:	1/4“ Swagelok, 10 PSIG
Exhaust (System):	NW25

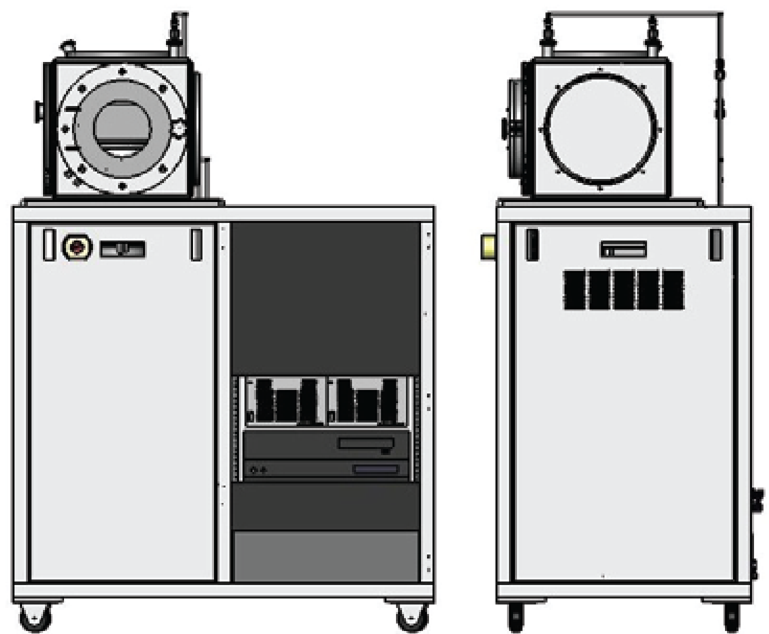
DIMENSIONS	Width	Depth	Height
NPE-3500	22”	26”	60”
NPE-4000	43”	26”	60”

NPE-3500



Front View **Side View**

NPE-4000



Front View **Side View**

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