



SP3 MODEL 250 HOT FILAMENT CVD REACTOR

For deposition of high-quality diamond films in research applications

The Model 250 Reactor is a cost-effective R&D platform for researchers who want to take advantage of the wide deposition area and uniform process associated with sp3's Model 600 HF CVD System. The Model 250 comes with a 15kW DC power supply, safety interlocks, a filament tensioning array, and a planar deposition fixture. It is designed to integrate easily with user supplied gas, vacuum, and control subsystems for user developed process recipes.

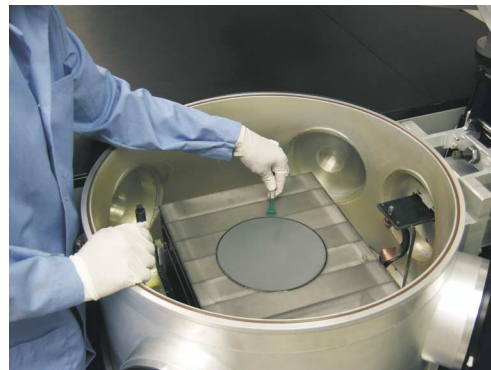
- ◆ Water-cooled process chamber
- ◆ Two-dimensional filament array with patented tension control mechanism
- ◆ Large deposition area—250mm by 250mm
- ◆ Two view ports plus two ports for metrology
- ◆ 15kW DC supply with control interface
- ◆ Easily interfaced to user supplied vacuum, gas supply and process control system
- ◆ Interlocks for chamber vacuum, cooling water flow and chamber temperature prevent unsafe equipment operation
- ◆ Patented reactor technology



This photo shows the water-cooled process chamber of the Model 250 Reactor which is used in the fully integrated Model 600 System. The base enclosure houses the DC power supply, and provides ample space for user-furnished metrology, gas and vacuum components, and control electronics.



The Model 250's wide chamber provides easy access for loading and unloading.



A wide range of applications

Over more than a decade sp3 has developed and applied hot-filament CVD technology to cutting tools and other mechanical uses, now expanding into a rapidly widening field of electronic applications based on diamond-on-silicon deposition.

The Model 250 CVD Reactor is designed for users who want to take advantage of sp3's excellent hot filament chamber and filament array design in conjunction with their own process development and control schemes.

The Model 250 will provide highly uniform diamond films over a span of 200mm within the 250mm by 250mm deposition area. Applications include films with variable grain size, micro-crystalline diamond, and nano-crystalline diamond.

Typical uses of the Model 250 are:

- MEMS
- SAW devices
- Heat spreaders
- Wear coatings
- Electrodes
- Cutting tools



Highly uniform films can be deposited on silicon wafers up to 200mm.



The colored fringes indicate a $\pm 5\%$ uniformity of the deposited diamond film on this 100mm wafer.

Summary specifications

Deposition rate:	Up to 1.1 micron/hour (substrate geometry and recipe dependent).
Deposition area:	625 sq cm (250mm x 250 mm).
Chamber ports:	Two view ports plus two ports for metrology.
Filament array:	2-dimensional array with tension control mechanism is provided.
Power consumption:	Approx. 15kW (exclusive of vacuum pump).
Vacuum pump:	Pump is not included.
Safety:	Hardware interlocks provided for chamber vacuum, cooling water flow and chamber temperature.
Footprint:	48 in. x 54 in. (117 x 132 cm).
Weight:	1,100 lb approx.
Power input:	208 VAC 3-phase, 5-wire, 70 Amp.
Cooling water:	6 gpm at 40 psi drop, 20°C maximum.
Access:	24 in. (60 cm) clearance at sides.



sp3 Diamond Technologies

2220 Martin Avenue
Santa Clara, CA 95050
877/773-9940; 408/492-0630
fax: 408/492-0633
email: diamond@sp3inc.com
web: www.sp3inc.com

Seki Technotron is the global distributor for sp3 CVD reactors. For more information on the sp3 Model 250 CVD Reactor please contact Seki Technotron.



Headquarters
5-6-30 Kiba, Koto-ku, Tokyo 135-0042
81-3-3820-1711 fax 81-3-3820-1735

Seki Technotron USA

2220 Martin Avenue
Santa Clara, CA 95050
888/273-6225; 408/986-9190
fax: 408/986-9191
email: sales@SekiCVDsolutions.com
web: www.SekiCVDsolutions.com