

# Nanosys500

## Nanoparticle Deposition Systems



### Components

#### **NanoGen50 Nanoparticle source**

The NanoGen50 nanocluster source uses a unique high-pressure sputtering source to generate nanoparticles within a condensation zone. These nanoparticles emerge from the source in a well-defined beam and can be directed towards a substrate for deposition or encapsulation.

#### **Multi-zone refinement**

The gas flow characteristics within the condensation zone ensure refinement of the size distribution of particles in the beam. The unique configuration of the condensation zone also maximises the ratio of nanoparticles to carrier gas entering the main deposition chamber. The source can be supplied with user-selectable refinement zones to suit particular applications. Nanoparticles can be generated with as few as 30 atoms up to those with diameters exceeding 15nm.

#### **Variable Energy Deposition**

A high fraction of the nanoparticles emerging from the source are negatively charged. This allows manipulation of the

particle beam either through deflection, focusing or acceleration. Accelerating the particles electrostatically allows the impact energy to be controlled precisely. At low acceleration the particles soft-land without deformation. At higher energy the particles undergo a small degree of interface mixing and form a layer of bound nanoparticles. At very high energy the particles fuse to revert to bulk material. Very high energy impact coating can be used to form adherent layers on materials which are otherwise difficult to coat at low temperature.

#### **Compound Nanoclusters**

Compound nanoclusters such as oxides or nitrides can be grown by adding a small amount of the reactive gas to the aggregation zone.

#### **Mass Filter**

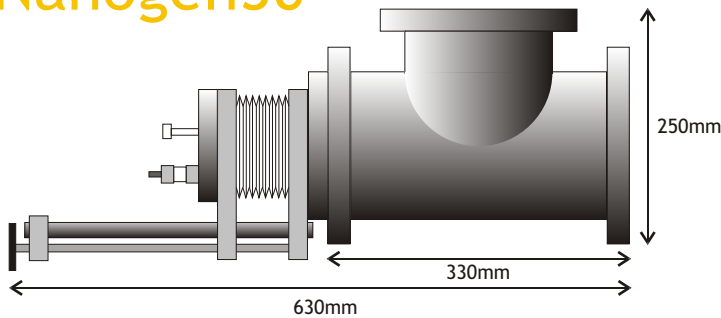
The MesoQ quadrupole mass filter can be used in-line with the NanoGen-50 to analyse and further filter the nanoparticle beam with throughput up to  $10^6$  amu. The quadrupole has an ultimate size resolution of 2% in filtering mode, allowing precise particle size definition to be achieved. When used in conjunction with the Nanogen source, the MesoQ allows high-throughput in filter mode as a high proportion of the beam is naturally ionised. The MesoQ is supplied as standard with software control.



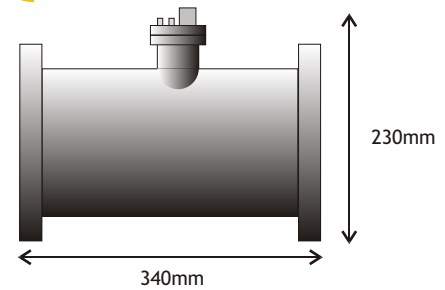
**MANTIS**  
MANTIS DEPOSITION LTD

# Specification

## Nanogen50



## MesoQ



Mounting flange	NW150CF / 8"
In vacuum length	0
Cluster range	1-15nm (material dependent)
Size variation	+/-5% (flow/power dependent)
Deposition rate	6 Angstroms/s (Max.)
Gas flow	5-100 sccm Ar/He
Cooling	Water / Ln2

Mounting flange	NW150CF / 8"
In vacuum length	0
Resolution	~2%
Mass range	2 - 10 <sup>6</sup> a.m.u.
PC Interface	A/D (Software included)

## Accessories

- Full NanoGen Automation** - The NanoGen50 can be offered with full automation including motorised linear feed, power control and gas control.
- Optical plasma monitoring** - The plasma conditions can be monitored using an integral optical fibre and accompanying spectrometer. PC Software and USB interface are included.
- Beam Steering** - The source can be fitted with beam-steering plates for manipulation of the ionic content of the beam

**OTHER:** Manual Teardrop Shutter, Automated Teardrop Shutter.



**MANTIS**  
MANTIS DEPOSITION LTD

MANTIS Deposition Ltd  
2 Goodson Industrial Mews  
Wellington Street  
Thame, Oxfordshire.  
Ox9 3BX  
UK  
Tel (UK): +44 1844 260160  
Fax (UK): +44 1844 260421  
sales@mantisdeposition.com