

DC Ion Sources

Parallel beam etching, assisted deposition, sputtering: 10eV-1keV

The DC filament-driven ion sources are an extension to the highly successful family of atom sources from Oxford Applied Research. They have been extensively developed with simple operation and servicing in mind. The flange mount sources are UHV compatible and primarily for use with argon. They are highly suited for applications such as ion-beam assisted deposition (IBAD), sputter deposition, etching, and substrate cleaning.

A high-transparency grid-set is used to extract ions from the plasma, resulting in a high beam current density and excellent beam profiles. Three sources are available: DC25, Dc25s and DC150. The DC25s ion source has been developed in response to increased demand for high ion currents at very low energies (< 20eV). Applications include insertion of ions into carbon nanotubes and fullerenes [1] and growth of high quality GaN [2].

[1] Weidinger et al., Appl. Phys., **A66**, pp287, 1998

[2] Sienz et al., J. Cryst. Growth, **264**, pp184, 2004

Compatible gases

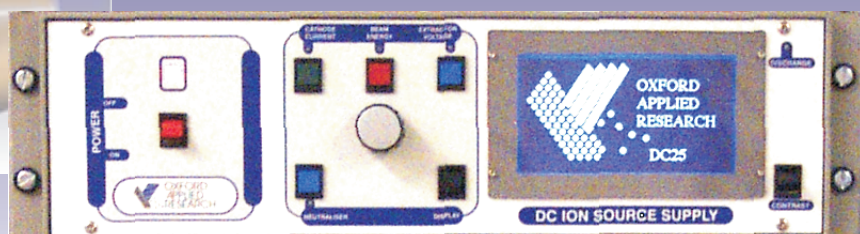
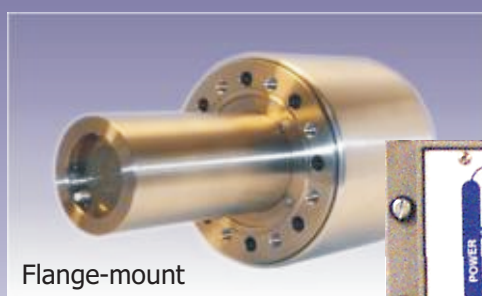
In addition to inert gases, the sources can also be used with O₂, N₂ and H₂

Beam profile

The sources can be equipped with a variety of grids, to tailor the beam profile to a particular application. For example, convex grids can be used for irradiation of large areas with high uniformity. Concave grids can be employed to focus the beam for applications where very high current-density is required, such as sputter deposition.

Beam Neutralisation

Ion impingement on insulating surfaces leads to a rapid build-up of charge, ultimately retarding the ion beam. This is overcome by injecting electrons into the ion beam to neutralise it. We offer plasma bridge neutraliser and filament-based electron injection sources. Both can be supplied for prolonged use with reactive gases.



Applications

- Ion-beam assisted deposition
- Ion-beam sputter deposition
- Ion-beam specimen thinning
- Parallel-beam etching
- Ion implantation

Features

- Beam energy 10eV - 1keV
- High beam currents
- Rugged construction
- Simple operation and servicing
- Good beam uniformity
- Single compact power supply

Specification

Model	DC25	DC25s	DC150
Standard in-vacuum length	100mm	100mm	230mm
Beam diameter	25mm	25mm	150mm
Mounting flange *	NW63CF	NW63CF	NW200CF
Ion beam energy	100eV-1keV	10eV-200eV	100eV-1keV
Beam current	40mA (max)**	5mA (max)	300mA (max)
Operating gas flow	3-10 sccm	3-10 sccm	15-20 sccm
Power supplies	Included (single unit)	Included (single unit)	Included
Grid material	Inconel, Mo***	Inconel, Mo***	Inconel, Mo***

* For externally mounted source. Internally mounted sources are also available

** Gas dependent

*** Parallel, concave, convex grid-set options

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