

Item No. 7: Detail specification of the Broad Beam Ion Source (One SET)

- 1) Application: Surface nanostructuring using broad beam ion source where sputtering is the true physical process
- 2) Proposed Chamber Shape: Spherical (SS304)
- 3) Chamber Diameter: 12 inch – Custom designed (See Item No. 10)
- 4) Pumping System: Turbo molecular pumping system of capacity 500 l/s, flange size DN160CFE backed by mechanical pump (User provided)
- 5) Ion source mounting configuration:

Mounting flange: 4½ inch (NW63CF) – 6 inch (NW100CF)

Working distance (planned distance from the ion source extraction point to the substrate): 3 inch- 6 inch (it may be finalized before fabrication)

In vacuum length: Maximum up to 300 mm (if required we may need to settle down at a lesser length, which can be finalized before fabrication)

Ion source diameter (in vacuum) should be mentioned

The connecting adapter (to mate the ion source and the chamber) should be quoted as an optional item along with all the dimensions

- 6) Desired ion species and working pressure:

Process gas through ion source: H, O, N, He, Ne, Ar, Kr, Xe (All gaseous species)
(It should be clearly mentioned if some or any particular gaseous species is not possible to accelerate – preferably with specific reasons)

It should also be mentioned whether other gases (e.g. CO₂, CH₄ etc.) and reactive species (e.g. Chlorine) are possible to be accelerated along with their possible long-term effects

Possibility of generating ions from solids / vapors: Any special attachment, if available, should be mentioned in a clear manner. Possibility of custom made attachment for producing ions from solids/vapors should be mentioned very clearly (along with the price tag)

Working Pressure: 10⁻⁷ – 10⁻⁸ mbar (Maximum)

Typical density of neutrals at this working pressure should be mentioned

7) Ion Source specifications:

Ion energy: Maximum up to 5 keV

Ion current: Tunable ion beam current on the target up to 20 mA (Maximum)

Ion current display should be provided as an integral part of the ion source. Beam shape monitoring device should be provided as an integral part

Typical ion current-energy distribution should be provided

All possible source-related parameters should have appropriate displays

Plasma indicator: Indication for plasma on/off

Beam diameter: 25 mm (Maximum) at the source; possibility to tune the beam size towards a smaller size should be mentioned clearly

Uniformity of the irradiation should be extremely high (proper data sheet should be provided)

[Substrate size: 10 mm × 10 mm (Maximum): Most Typical]

Gas flow rate: 1 – 100 sccm (for getting gaseous ions) (Typical)

Leak valve and gas flow meter should be preferably quoted as integral parts of the ion source

Filament/Grid: Filamentless and/or gridless ion source will be preferred. If not available, then the best possible product(s) should be quoted. Beam stability should be mentioned in clear terms (for different conditions)

Grid and filament materials (if at all used in the ion source) and life time must be provided

Power supplies and cables: Ion production, extraction, and other rack mounted power supplies and cables should be quoted as an integral part of the ion source

Cooling system: Cooling requirements should be clearly mentioned and if possible should be indicated whether it will be an integral part of the system or can be provided as an optional item

8) Optional items:

Shutter, Faraday cup integrated in shutter, and collimators should be quoted as optional items

Differential pumping system should be quoted as optional item
If the ion source includes grid/filament, then spare grids or filaments should be quoted as optional items

Any other relevant items/accessories (left above) should be quoted in addition

- 9) Remote Control Option: Analog (0-5V or 0-10V) and RS-232 for control and operation of the ion source
- 10) Input power to the power supply: Voltage 220-240 V; 1-Phase; Frequency 50 Hz
- 11) Technical data sheet/ manual should be provided

Warranty: Period should be mentioned in clear terms

Installation: Free of cost

Service facility: Supplier should mention about the possible service set up and how capable they are to provide after sales service

Pre-installation Requirements: To be supplied by the manufacturer well in advance after the award of the bid

List of Users: The supplier should provide a list of current users of their product (including in India).