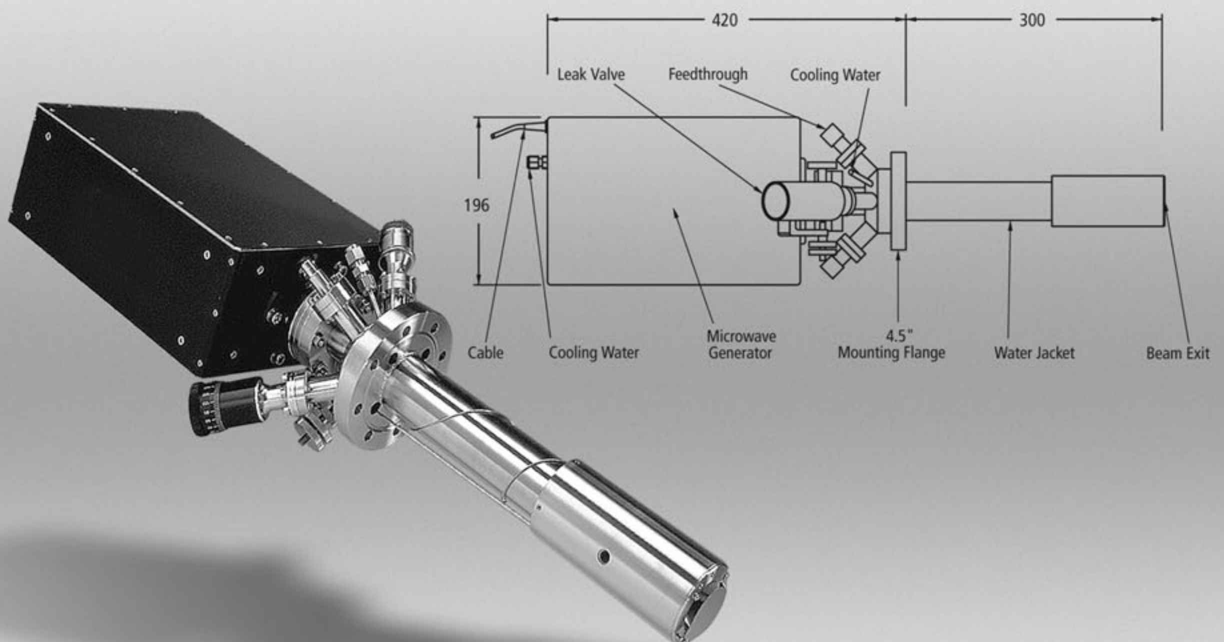
COMPONENTS FOR SURFACE ANALYSIS

Microwave Plasma Source
PCS-ECR

- Microwave coupled plasma
- For Oxygen, Nitrogen, Hydrogen
- Filamentless design
- No microwave tuning required
- User configurable coaxial design
- Integral water cooling jacket



SPECS®

The Microwave Plasma Source PCS-ECR

The SPECS Plasma Cracker Source PCS-ECR is a truly UHV compatible source for most demanding MBE applications. Through the action of the well-known electron cyclotron resonance (ECR) phenomenon, a high density plasma is created by coupling a radially symmetric 2.45 GHz microwave field to ions on the 86 mT surface of a multi-polar magnetic array. The absence of a hot filament permits operation with most gases including reactive gases such as oxygen, chlorine, nitrogen and hydrogen. A unique combination of features and options make this a highly versatile plasma source.

Main Features:

- Mounting flange: 4.5“ (NW63CF)
- UHV compatible
- Bakeable: 200° C
- Power: 250 W max. at 2.45 GHz
- Magnet type: permanent
- Integral water cooling (feedthrough and jacket)
- In vacuum length: 300 mm
- Beam diameter: ~ 25 mm at source
- Gas flow rate: < 0.1 sccm to 100 sccm (mode dependant)
- Working distance: 50 - 300 mm

Options:

- Integrated shutter
- Non standard lengths
- Various aperture types
- Differential pumping: Extends the range of working pressures into the ~ 10^{-7} and 10^{-8} mbar range
- Faraday cup: Provides the possibility to monitor the beam current
- Ion trap: Deflects residual ion current out of the beam

Operating Modes:

The source can be operated in three distinct modes, according to the extraction optics fitted and covering a wide range of ion energies and particle types.

Atom source – Thermal energy neutrals

This mode is intended for low energy and low damage surface treatment and sample growth. The particles released are largely thermalised (< 1 eV) and are therefore suitable for sensitive applications.

Downstream plasma/ECR mode – Low energy ions and neutrals

This mode reproduces classic ECR source characteristics. The optics here allow ions and higher energy plasma particles (~ 25 eV) to flood out into the chamber.

Hybrid – Atom source ECR characteristics with controllable ions

This mode combines atom source and ion source behaviour to produce a source, which behaves like the atom source above until potentials are applied to the extraction grids, when ions with controllable energy (50 - 1500 eV) are then added to the beam.

Applications:	
Nitrogen:	Nitriding (GaN, AlN, InN and SiN), doping (ZnSe) and alloying (GaInNAs,GaAlAsN)
Oxygen:	HTc superconductors, optical coatings, dielectrics, reactive sputtering, laser ablation and ceramic growth (Al_2O_3) Oxygen cleaning and oxidation kinetics, post growth oxidation / low temperature SiO_2
Hydrogen:	Cleaning, growth enhancement / surfactant
Chlorine:	In-situ etching
Methane (carbon):	SiC film growth

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ISO 9001 Certificate

Your Representative:

03/06 · SPECS reserves the right to alter technical specification without further notice.