# i-FIB

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Key Features	
Source	Compact Plasma Ion Source ( 2.45 GHz HF Electron Cyclotron Resonance technology)
Ion Species	Xe+ / Ar+ / N2+ / He+ / O2+
Energy Range	3 - 30 keV
Probe Current	1 pA – 2 µA
Optimal Working Distance	12 mm
Optional UHV Configuration	Maximum bakeout temperature is 120 °C
Ion Beam Guaranteed Performances at 30 keV / Xe+/ WD = 12 mm	
Beam Current	< 1 pA
Ultimate Resolution	25 nm

i-FIB column is the perfect answer for **today's very high etching rate** growing demands. With the **patented compact no cooling ECR source technology**, i-FIB achieves a **sputtering rate up to 50 times higher than the most powerful Ga FIB** keeping sharp current distribution. These assets are well adapted for sub-100 nm thickness samples preparation required for high-quality TEM images. Not only has i-FIB the great asset to get rid of gallium primary ions thanks to the use of noble gas ions non-contaminant for microelectronic processes, but also it is able to deliver probe current up to 2  $\mu$ A making the milling of large structure much more time effective.



Nano-pillar prepared with i-FIB on a TESCAN FERA3 (FOV =  $274 \ \mu m$ )



Cross section through a bump in a semi-conductor device made with i-FIB (BSE images) (FOV =  $238 \ \mu m$ ) (FOV =  $13 \ \mu m$ )



Ant bead slices performed with i-FIB (FOV = 690 μm)



 $(FOV = 420 \ \mu m)$ 

 $(FOV = 47 \ \mu m)$ 



Hair cross section performed with i-FIB (FOV =  $145 \ \mu m$ )

With i-FIB, save an hour every minute



Cross section of MEMS sample using i-FIB on a TESCAN FERA3 (FOV =  $125 \ \mu m$ )

#### Description

The i-FIB column equipped with **patented compact ECR plasma technology ion source** delivers increased throughput to keep up with many fields of applications, such as failure analysis in the semiconductor industry (e.g. TSV or flip chip cross sectioning), MEMS fabrication and analysis, TEM sample preparation and biotechnology. Compared to Ga FIB, this plasma column offers **greater sample currents**, a **higher milling rate** and a **large field of view (1000 µm x 1000 µm)**.

The plasma source generates a large panel of ions especially dedicated for milling (Xe or Ar), imaging (He) and surface analysis (O<sub>2</sub>). An accurate and automated microleak valve controlled via a precision screw regulates the primary ion flow.

i-FIB is easily adaptable on any vacuum chambers as it is also **available in a UHV configuration** and so bakeable up to 120°C.



SEM image of very large TEM lamella prepared with Xe i-FIB on TESCAN FERA3 (FOV = 270 μm widtb)

### Main characteristics

- Mechanically-controlled 2-axis XY and tilt motion for source alignment
- Very stable ECR source to reach higher beam currents using a great panel of ion species
- Pneumatic valve isolating the gun from the bottom part of the column for easy replacement and maintenance of the source
- 14 movable apertures for higher reproducibility and performances
- Fully integrated electrostatic beam blanker and Faraday Cup for precise current measurements

www.orsayphysics.com



95 Avenue des Monts Auréliens ZA Saint-Charles - F - 13710 Fuveau Phone : +33 442 538 090

Email : contact@tescan-orsay.fr Sales Phone : +33 442 538 466