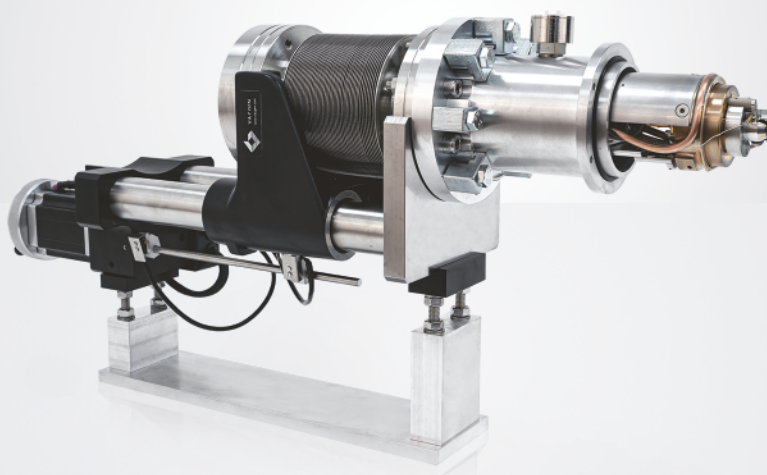


# GIB

## Gentle Ion Beam to Scanning Electron Microscope

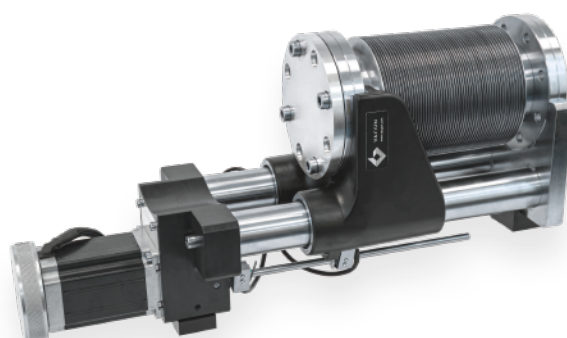


Technoorg's low-energy gun (LEG) is an argon ion source suitable for surface thinning, post-treatment after other surface treatments, cleaning, and removing amorphous and oxide surface layers. The low-energy Ar-ion source can be particularly useful when attached to a scanning electron microscope, allowing samples to be cleaned just before their investigation. Another valuable application for achieving the highest quality samples is the final polishing and gentle surface cleaning of TEM samples after FIB preparation in dual beam SEM/FIB systems.

## LINEAR TRANSFER SYSTEM

In the GIB system, the Ar ion gun is built into a linear transfer system with a bellows. The purpose of mobility is to allow the gun to be retracted when not in use.

The movement range of the mechanism is 150 mm, the mounting flange size is 114 OD (DN63), and the diameter of the clear bore through the bellows is 68 mm.

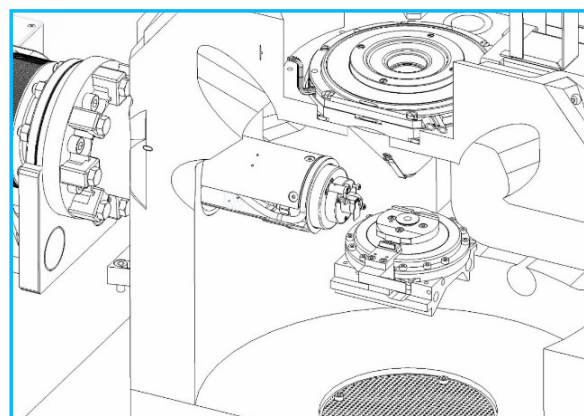


## INSTRUMENT CONTROL UNIT

The electronics, closed-loop cooling system, and Ar gas pressure sensor are located in the control unit. High-purity (99.999 %) Ar gas supplies the ion source, and its flow rate is regulated by a high-precision needle valve. The control software runs under the Windows operating system and can be installed on a separate computer or on the SEM's computer.

## ATTACHMENT TO A MICROSCOPE

The transfer system with the bellows can be attached to the SEM through a connecting tube. The size of the output flange of this tube matches the size of the corresponding SEM port. The ideal working distance (15-30 mm) can be achieved through the ion source mobility provided by the linear transfer system.

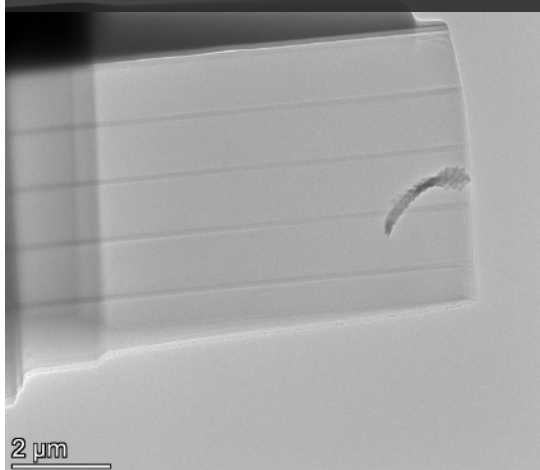




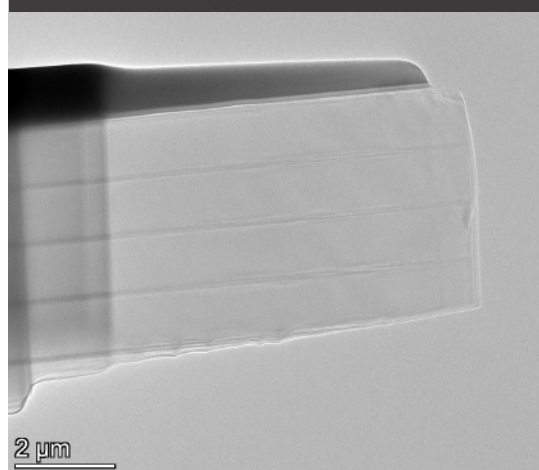
## LOW-ENERGY SOURCE

The Gentle Ion Beam system is designed to operate at argon ion energies as low as 200 eV, effectively minimizing the damage to the samples while avoiding resputtering. The system provides a broad beam with a maximum current of 70  $\mu\text{A}$  at 2 kV. The beam has a full width at half maximum (FWHM) of 1.1 mm at a distance of 30 mm, ensuring precise and gentle sample treatment. These features allow GIB to produce pristine and Ga-free lamellae without any damaged or amorphous layers after FIB preparation.

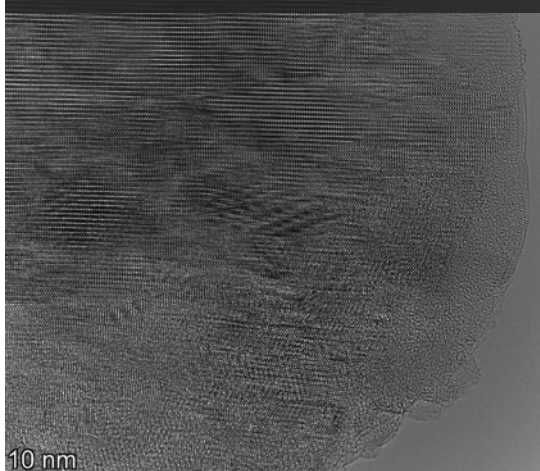
TEM lamella after 5 kV FIB thinning



The same FIB lamella after LEG thinning and cleaning



GaN sample after FIB 5kV final cleaning step



After GIB treatment the sample is thinner and free of crystal defects and amorphous layer

