Tescan Aura Gentle Ion Beam™

A fully integrated Gentle Ion Beam™ to achieve exceptional TEM specimen quality for clear atomic resolution and effortless investigations in (S)TEM, even for the most challenging materials

Tescan Aura™ is an optional add-on of fully integrated Gentle Ion Beam™ technology by Technoorg Linda for Tescan AMBER and SOLARIS FIB-SEM series. Introducing a cutting-edge low-energy ion source for fine sample treatment inside the microscope vacuum chamber, fully integrated with the FIB-SEM control interface. The Gentle Ion Beam™ is equipped with a carefully designed working gas supply system that ensures purity and reliability. It features a sophisticated closed-circuit cooling system for optimal stability and performance.

A multi-purpose sample holder enables in-situ TEM lamella preparation by FIB-SEM, optimal geometry for low-energy post-FIB treatment and STEM imaging for sample quality observation that meets the demanding requirements for best quality TEM sample preparation.

A recipe-based processing of TEM samples to streamline operation and reproducible workflow accessible for all users. The control is built-in the FIB-SEM control software, enabling seamless communication with hardware.

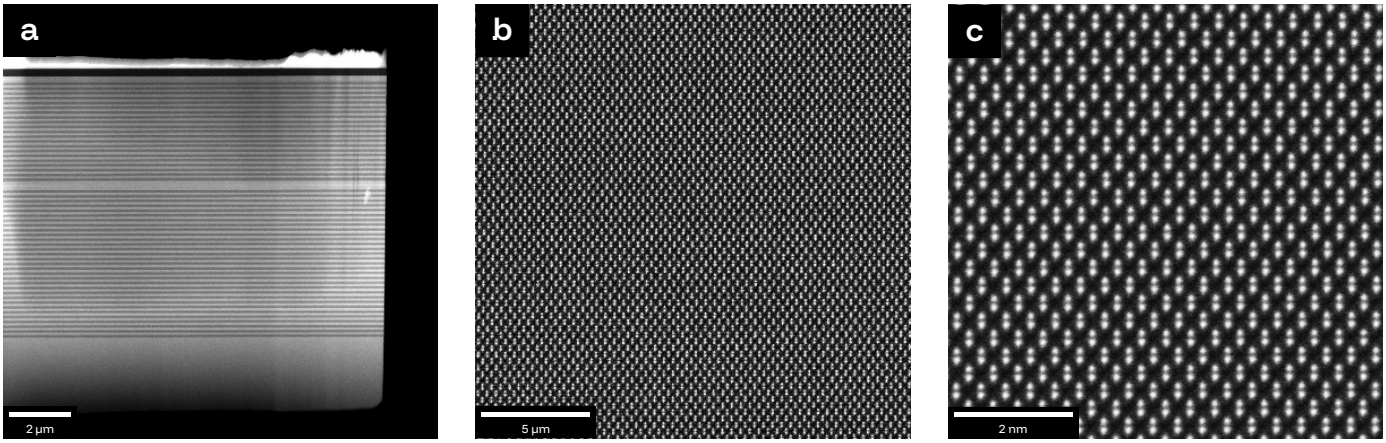

Fig. a) HAADF STEM image of TEM lamella prepared by Ga FIB-SEM from a GaAs/AlGaAs multi-layer structure. b+c) A high-resolution HAADF STEM images revealing clear atomic structure of GaAs at high magnification after Gentle Ion Beam treatment performed down to 300 eV without signs of Ga contamination from previous Ga FIB-SEM sample fabrication.

Key Benefits

- **Achieve the thinnest TEM specimens with negligible amorphization/intermixing, ensuring unmatched clarity in your high-resolution (S)TEM investigations**, utilizing the integrated Gentle Ion Beam™ system for ultra-fine Ar^+ polishing at energies as low as 200 eV
- **Remove surface contamination, oxidation layer from your TEM specimens, eliminate Ga-implanted zones, minimize intermixing and ensure so the highest purity and clarity in your (S)TEM analyses** by gently repolishing your TEM samples with Ar^+ GIB.
- **Reduce the risk of TEM sample degradation during transfer between devices** and perform quality end-pointing using a sub-nanometer resolution R-STEM detector integrated in the FIB-SEM.
- **Accelerate preparation of the thinnest specimens, and guarantee the final quality of TEM specimens for high-resolution (S)TEM investigations** by leveraging the seamless integration of the Gentle Ion Beam™ system within the FIB-SEM, equipped with STEM in SEM inspection capabilities
- **Streamline your TEM specimen cleaning process with recipe-based Gentle Ion Beam™ processing**, ensuring quick and reliable creation of high-quality specimens following the TEM AutoPrep Pro's automated preparation, making high-quality specimen production effortless for all users

Gentle Ion Beam Essential Technical Specifications

Beam energy	≤200 - 2000 eV
Beam curren	5 - 80 µA (beam energy dependent)
Beam diameter (FWHM)	2000 – 1250 µm @ WD=30mm
Beam current density	Max. 3.6 - 6 mA/cm2 @ WD=30 mm
Working gas	Ar
Typical operating pressure	5 - 20 x 10–4 Pa (beam energy dependent)
Positioning accuracy	0.1 mm

A fully retractable Gentle Ion Beam source integrated in the FIB-SEM

Installation requirements

Working gas supply system	working gas Ar (gas cylinder + valve not part of the delivery) working gas purity 99.999% input pressure: 1.5 ± 0.2 bar absolute working gas consumption: 1 SCCM max.
Environment parameters	pollution degree: 2 (laboratory areas) protection class: I overvoltage category: II (connected directly to the power outlet) voltage wobbling: ± 10%.
Cooling liquid	coolant capacity: 300 cm3 max. coolant type: 1:1 mixture of deionized water and a propylene-glycol-based heat transfer fluid with several types of inhibitors and biocides
GIB instrument control unit requirements	input power: 100 - 240 V AC, 50/60 Hz max. power consumption: 450 W height × width × depth: 311 (344) × 449 (495) × 310 mm3 weight: ~18 kg

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TECHNOORG LINDA

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