Hitachi Focused Ion & Electron Beam System

nanoDUE'T NB5000

Hitachi High-Technologies

NB5000

HITACHI

Focused Ion & Electron Beam Sys

Hitachi's high performance FIB-SEM provides unparalleled nano-analyses of devices and functional materials !!

Legendary Hitachi reliability and performance in an integrated system
(Ultra-high performance FIB and high resolution FE-SEM)
enabling high-throughput specimen preparation,
high resolution imaging and analysis and precision nanofabrication.
New low-damage fabrication techniques have been developed for materials sensitive to electron irradiation. Innovations in sample loading, sample navigation, and Micro-sampling increase analysis efficiency*1.

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nanoDUE'T NB5000

Features

Ultra-high performance FIB

Low Cs FIB optics*2 deliver 50nA or more of beam current (@40kV) in an about 1μm spot-size. The high current enables unconventional large-area milling, hard material fabrication and high throughput multiple specimen preparation.

New Micro-sampling*2

Hitachi's patented Micro-sampling technology provides smooth probe motion. Also, the probe can be used for newly developed absorbed current imaging*1 to aid fault isolation.

High precision end-point detection

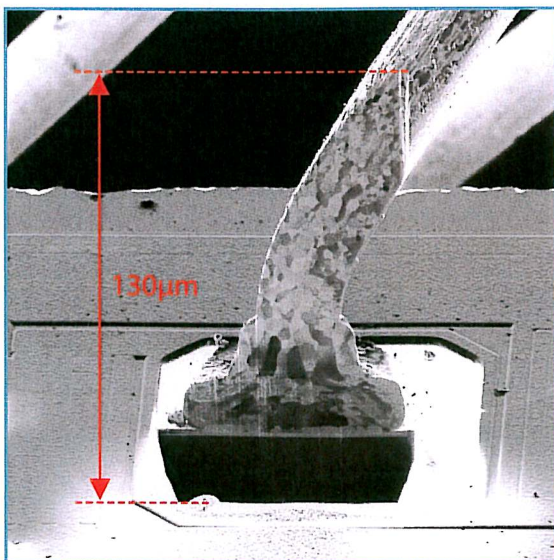
High resolution SEM allows high precision end-point detection. Section-view function, which displays an outline of the cross-section utilizing the real-time FIB image, is ideal for preparing electron irradiation sensitive specimens like Low-K material.

High resolution SEM

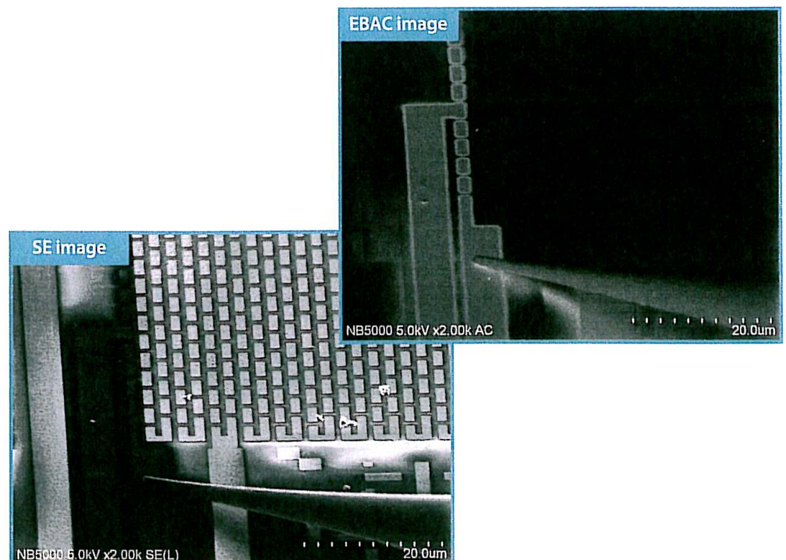
Hitachi's unparalleled SEM column and detector design*2 enables high resolution SEM imaging during and after FIB fabrication.

Holder compatibility with TEM/STEM*1,*2

A side entry STEM/TEM-type stage*1 allows the use of the same specimen holder (compatible with NB5000 and Hitachi TEM/STEM). No tweezer handling of specimen during transfer results in higher throughput TEM/STEM analysis.



Large-area milling of wire bonding
(milled area : 75 (w) × 130 (h) μm, milling time : 19min.)



EBAC (Electron Beam Absorbed Current) imaging*1
with new Micro-sampling system

*1 Optional accessory
*2 Hitachi patent Low Cs FIB optics : patent pending, Micro-sampling : JP2774884/US5270552, Section-view function : patent pending, SEM column and detector design : JP3081393,US5387793, Holder compatibility : JP2842083

Specification

FIB	Accelerating voltage		1 ~ 40kV
	Beam current		50 nA or more @40kV (CP)
	SIM resolution		5nm @ 40kV (CP)
	Magnification		×60 ~ ×250,000
	Ion source		Ga Liquid Metal Ion Source
	Lens system		Low Cs 2-stage electrostatic lens system
SEM	Accelerating voltage		0.5 ~ 30kV
	SEM resolution		1.0 nm @15kV (CP) 2.1 nm @1kV (OWD)*2
	Magnification	High Mag mode	×250 ~ ×800,000
		Low Mag mode	×70 ~ ×2,000
	Electron source		ZrO/W Schottky emission
	Lens system		3-stage electromagnetic lens reduction system
Signal selection	SEM		Upper SE, Lower SE, Absorbed current*1
	FIB		Lower SE, Absorbed current*1
Eucentric stage	Traverse range		X : 50mm (30mm*2), Y : 50mm (30mm*2), Z : 22mm T : -1.5 ~ 58.3°, R : 360°
Sample size	Maximum diameter		ϕ50mm (ϕ30mm*2)
Deposition	Material		Tungsten/Carbon (changeable)
Micro -sampling	Probe exchange		Load lock type
	Additional function		Touch sensing, Absorbed current imaging*1

CP : Beam Cross Point
OWD : Optimum Working Distance

*1 Optional accessory
*2 When side entry stage is ordered

Utilities

Temperature	15℃ ~ 25℃ (Variation during operation : 2℃ or less/hr)
Humidity	60% RH or lower
Power	Single phase 200V (±10%), 8kVA (50/60Hz)
Grounding	D class, Grounding resistance : 100Ω or less
Water	Please use a water circulator. Flow rate : 1.0 ~ 1.3L/min (Water pressure : 50 ~ 130kPa) Water temperature : 10 ~ 20℃ (Variation : 0.5℃ or less/10 min.)
Gas	Air 0.4 ~ 0.6 MPa, For valve control N_2 gas 30 ~ 50kPa, Needed for N2 gas column leak

Optional accessories

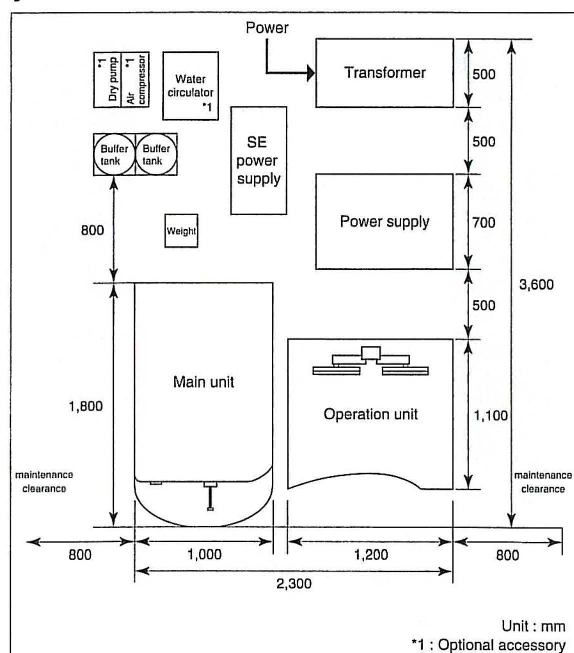
Holder scope, Absorbed current imaging, Automatic fabrication software, Side entry stage, Specimen rotation holder, Energy Dispersive X-ray spectrometer (EDX), Water circulator, Air compressor, Dry pump

Dimensions and weight

Unit	Width × Depth × Height (mm)	Weight (kg)
Main unit	933 × 1,747 × 1,900	1,129
Operation unit	1,200 × 1,025 × 740	188
Power supply	980 × 640 × 1,565	463
Transformer	980 × 454 × 625	192
SE power supply	394 × 754 × 780	122
Buffer tank (x2)	@280 × 280 × 665	@18
Dry pump*1	400 × 252 × 336	25
Water circulator*1	450 × 400 × 660	55
Air compressor*1	400 × 230 × 550	18
Weight	200 × 180 × 160	40

*1 Optional accessory

Layout



NOTICE: For proper operation, follow the instruction manual when using the instrument.

Specifications in this catalog are subject to change with or without notice, as Hitachi High-Technologies Corporation continues to develop the latest technologies and products for our customers.

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