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.
Features

- **Ultra-high performance FIB**
  Low Cs FIB optics\(^2\) deliver 50nA or more of beam current (at 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\(^*1\)**
  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.

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

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

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\(^*1\) 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/JUS5387793, Holder compatibility: JP2842083
### Specification

- **FIB**
  - Accelerating voltage: 1 ~ 40kV
  - Beam current: 50 nA or more @ 40kV (CP)
  - SIM resolution: 5nm @ 40kV (CP)
  - Magnification: x80 ~ x250,000
  - 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 mm @ 15kV (CP)
  - Magnification: x250 ~ x800,000 (High Mag mode), x70 ~ x2,000 (Low Mag mode)
  - 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)
- **Probe exchange**
  - Load lock type
- **Micro-sampling**
  - Additional function: Touch sensing, Absorbed current imaging*1

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

### 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

<table>
<thead>
<tr>
<th>Unit</th>
<th>Width x Depth x Height (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main unit</td>
<td>933 x 1,747 x 1,900</td>
<td>1,120</td>
</tr>
<tr>
<td>Operation unit</td>
<td>1,200 x 1,025 x 740</td>
<td>186</td>
</tr>
<tr>
<td>Power supply</td>
<td>980 x 640 x 1,565</td>
<td>463</td>
</tr>
<tr>
<td>Transformer</td>
<td>980 x 454 x 625</td>
<td>192</td>
</tr>
<tr>
<td>SE power supply</td>
<td>394 x 754 x 780</td>
<td>122</td>
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<tr>
<td>Buffer tank (x2)</td>
<td>@250 x 280 x 655</td>
<td>16</td>
</tr>
<tr>
<td>Dry pump*1</td>
<td>400 x 252 x 330</td>
<td>25</td>
</tr>
<tr>
<td>Water circulator*1</td>
<td>450 x 400 x 660</td>
<td>55</td>
</tr>
<tr>
<td>Air compressor*1</td>
<td>400 x 230 x 550</td>
<td>18</td>
</tr>
<tr>
<td>Weight</td>
<td>200 x 180 x 160</td>
<td>40</td>
</tr>
</tbody>
</table>

*1 Optional accessory

### Utilities

- **Temperature**: 15°C ~ 25°C (Variation during operation: ±2°C or less/hr)
- **Humidity**: 60% RH or lower
- **Power**
  - Single phase 200V (±10%), 60/60Hz
- **Grounding**
  - D class, Grounding resistance: 100Ω or less
- **Water**
  - Flow rate: 1.0 ~ 1.3L/min (Water pressure: 50 ~ 130kPa)
  - Water temperature: 10 ~ 20°C (Variation: 0.5°C or less/10 min.)
  - Air: 0.4 ~ 0.8 MPa, For valve control
  - N₂ gas: 30 ~ 50kPa, Needed for N₂ gas column leak

### Layout

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**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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