

Specifications for Hitachi Model S-5000, Field Emission Scanning Electron Microscope

1. Resolution:

Accelerating voltage 30kV
Sample Height =0.5 mm..... 0.6 nm
Accelerating voltage 1.0kV
Sample Height =1.5 mm..... 3.0 nm

2. Magnification:

High magnification mode X 250 ~ X 1,000,000
Low magnification mode X 30 ~ X 500

3. Electron Optics:

- (1) Electron gun Cold cathode field emission type
- (2) Extracting voltage (Vext) 0 to 6.5 kV
- (3) Accelerating voltage (Vacc) 0.5 to 30 kV (in 100 V steps)
- (4) Lens 3-stage electromagnetic lens, reduction type
- (5) Objective lens aperture Movable aperture (4 openings selectable/
alignable outside column).
Self-cleaning thin aperture
- (6) Astigmatism correction coil
(stigmator) Electromagnetic type
- (7) Scanning coil 2-stage electromagnetic-deflection type

4. Specimen Stage

- (1) Motion
X Traverse -3.5 mm to +3.5 mm (continuous)
Y Traverse -2.0 mm to +2.0 mm (continuous)
Z Traverse -0.3 mm to +0.3 mm (continuous)
Tilt -40° to +40°
- (2) Maximum specimen size
Flat specimen(1) 5.0 mm X 9.5 mm X 2.4 mm (H)
Flat specimen(2) 5.0 mm X 9.5 mm X 4.4 mm (H)

- (3) Specimen exchange Airlock system

5. Display Unit

- Principle Flicker-free display with built-in image memory (at all scan speeds)
- Viewing CRT 12" display monitor x 2 sets (including an image memory unit)
- Photo CRT Ultra high resolution type (recording area: 120 x 90 mm) x 1 set
- Scanning mode Normal scan, split screen/dual magnification, line scan, position setting, spot, AAF (analysis area finder), SAA (selected area analysis), oblique mode
- Scanning speed 0.3, 2, 10/9, 20/25 s/frame for viewing mode (50/60 Hz)
TV, 40/35, 80/100, 160, 320 s/frame for photo recording mode (50/60 Hz)
TV signal : NTSC or PAL
- Signal processing/ Automatic brightness & contrast control, gamma control, operation mode
dynamic stigmator monitor, auto focus, automatic stigmator
- Recordable/printable data Film no., accelerating voltage, magnification, micron scale, micron value, date/time and working distance printable on picture
- Data entry Arbitrary alphanumeric characters and symbols overlayable at any image position through keyboard
- Electrical image shift $\pm 20 \mu\text{m}$ at WD 20 mm

6. Vacuum Systems

- Vacuum sequence Full-auto pneumatic valve system
- Ultimate vacuum 7×10^{-4} Pa (specimen chamber)
 1×10^{-7} Pa (electron gun chamber)
- Vacuum pumps Electron optics : 3 ion pumps
Specimen chamber : 1 diffusion pump
2 rotary pumps
- Compressor 1 unit

7. Safety Device

Protection against power, water and vacuum failure