

Transmission Electron Microscope
HT7800series

Revolution of Ultimate Luxury Imaging by Hitachi HT7800 TEM

Expanding the Boundaries
of Electron Microscopy



From biomedicine to nanomaterials

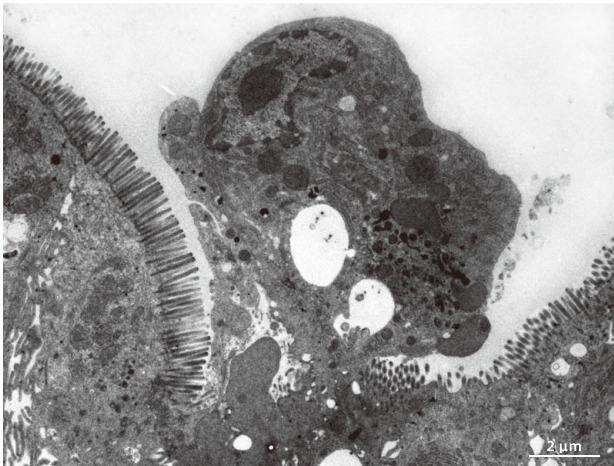
RuliTEM: The NEXT generation of Innovation. Meeting and exceeding needs in many fields.

The RuliTEM is a 120-kV transmission electron microscope with multiple lens configurations including a *standard lens* for unsurpassed high contrast and a class-leading *HR lens* for high resolution. This breakthrough in advanced innovative design allows for highly efficient workflows and many specialized applications. It represents the cutting-edge solution for modern TEM analyses.



High-contrast biological specimen observation – *Standard lens*.

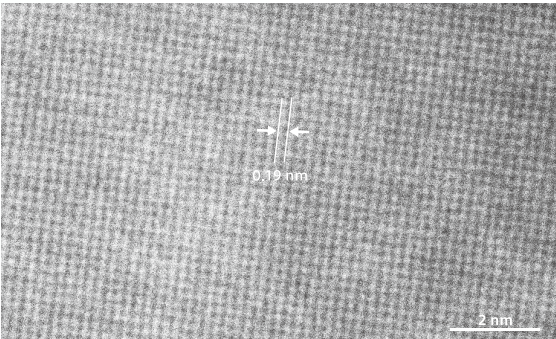
New system design optimized for wide-field High Contrast viewing allows for easy observation of unstained biological sections, even at low magnification.



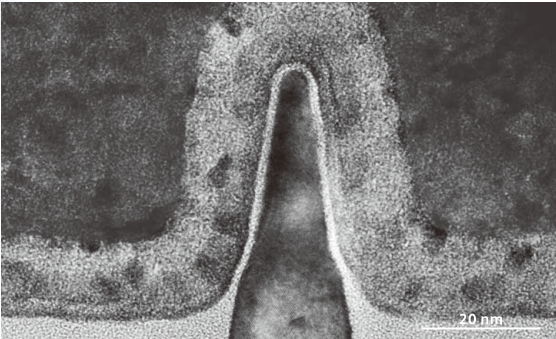
Specimen: Rat jejunum (unstained); Instrument: HT7800;
Accelerating voltage: 80 kV; Direct magnification: $\times 2,000$;
Specimen courtesy by Prof. Akira Sawaguchi, Faculty of Medicine, University of Miyazaki

Materials and device observation – *High Resolution lens*.

The new High Resolution lens design reduces spherical aberration and provides a class-leading 0.19 nm on-axis lattice resolution.



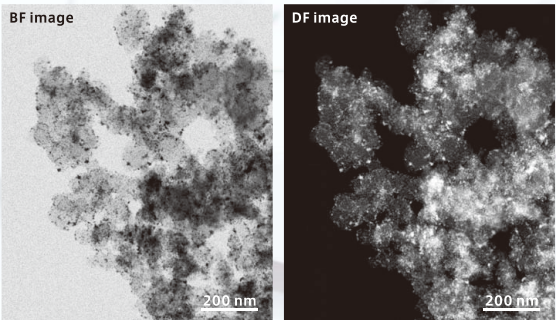
Specimen: Si single crystal; Instrument: HT7830;
Accelerating voltage: 120 kV; Direct magnification: $\times 1,000,000$



Specimen: 22 nm node FinFET device; Instrument: HT7830;
Accelerating voltage: 120 kV; Direct magnification: $\times 300,000$

STEM*1 observation of fuel-cell materials

Simultaneous BF and DF imaging enables clear observation of metal particle distribution.



Specimen: Pt/C electrocatalyst; Instrument: HT7830, Accelerating voltage: 120 kV,
Direct magnification: $\times 120,000$; Mode: STEM High Mag. mode

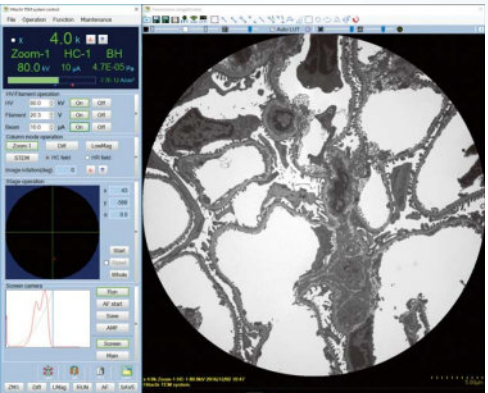
*1:Optional

Main Features

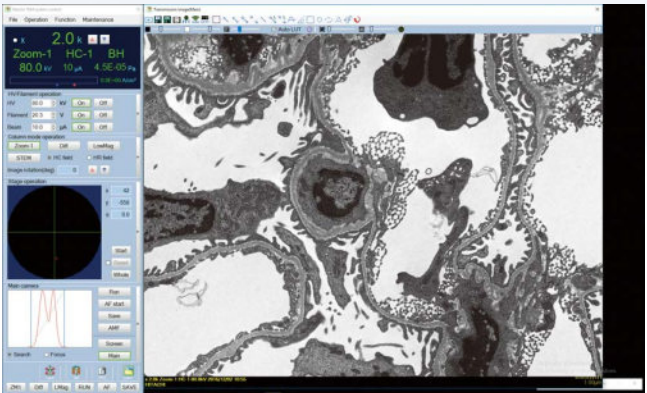
- Hitachi's *Dual-Mode* objective lens supports easy observation under Low Magnification, wide-field High Contrast, High Resolution and more all in one microscope.
- Normal room light operation and automated functions allow for effective utilization by novice and experienced operators.
- Advanced stage navigation function enables whole grid searching and efficient image acquisition.
- Automated image stitching, 3D tomography, STEM, EDX, *in-situ* and other options available for a broad range of applications.

Operation under normal room light conditions using HD screen camera.

Digital functionality from beam adjustments to observation and more.



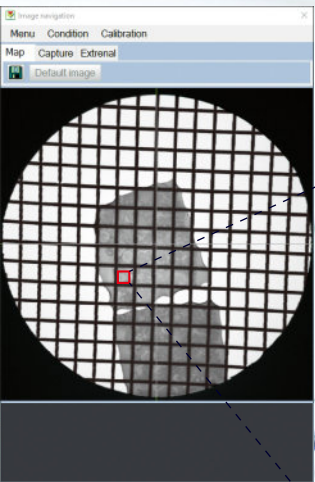
Screen camera



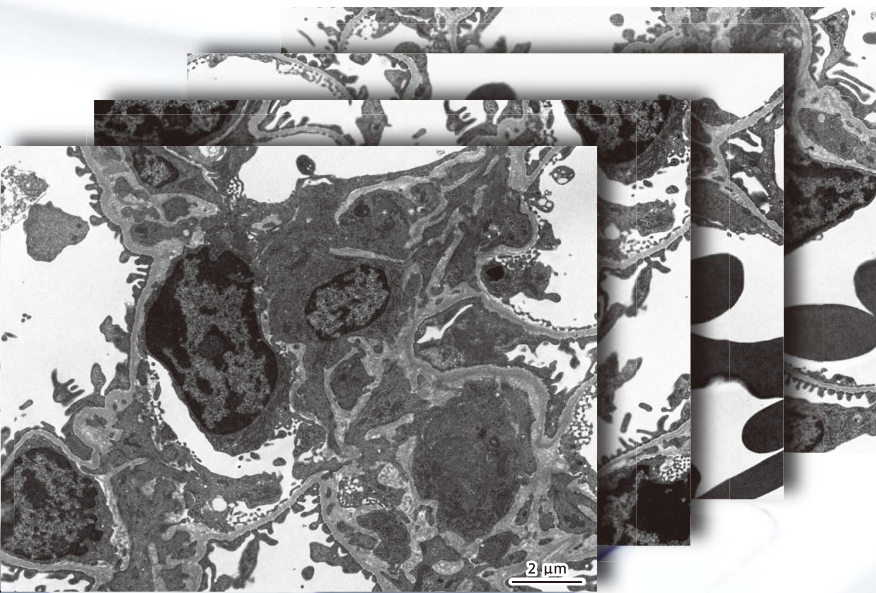
Main camera

New Image Navigation design for intuitive field searching.

Ability to specify ROI in low-mag image and easily capture at desired magnification.



Specimen: Mouse kidney; Instrument: HT7800;
Accelerating voltage: 80 kV;
Direct magnification: $\times 2,000$



RuliTEM
HT7800series

■ Essential specifications (TEM)

Items		Description	
		HT7800	HT7830 (High resolution lens)
Resolution (Lattice) *1		0.20 nm (Off-axis, 100 kV)	0.19 nm (On-axis, 120 kV)
Magnification	Zoom	×200–×200,000 (HC mode) ×4,000–×600,000 (HR mode)	×1,000–×300,000 (HC mode) ×4,000–×1,000,000 (HR mode)
		(Non-rotating zoom system)	(Non-rotating zoom system)
	Low Mag	×50–×1,000	×100–×1,000
Accelerating voltage		20–120 kV (100 V/step variable)	
FOV rotation		×1,000–×40,000 (HC mode)	NA
		±90° 15° steps	
Specimen stage		4-axis eucentric goniometer stage	5-axis eucentric goniometer stage
Stage traverse		X, Y: ± 1 mm, Z: ± 0.3 mm	X, Y: ± 1 mm, Z: –0.15mm– 0.3mm
Maximum tilt angle		±70°	±10°
Main camera		8M pixel (Other cameras are also available)	
Standard features *2		Auto focus, Microtrace, Autodrive, Autophoto, Live FFT display, Measurement function (manual/automatic distance measurement), Low dose, API (auto pre-irradiation), Image navigation function, Column with mild baking function, Whole view function*3, Drift correction function, 3D tilt image acquisition function*3, 3D reconstruction software*3, etc.	

■ Option accessories

STEM, Cold finger, X-ray analysis system (EDX), LaBe filament*4, Beam stopper*4, Selected area aperture*4, 5-axis eucentric goniometer stage*4, TEM mapping, Various specimen holders, Chiller unit, Dry pump, etc.

■ Installation site conditions

Items		Description	
Power	Voltage	Single-phase AC 100 V ±10%	
	Frequency	50/60 Hz	
	Capacity	Max. 4.0 kVA (including STEM)	
	Grounding	Independent grounding with resistance of 100 Ω or less	
Cooling water (Use a chiller)		Temperature: 15–20 °C (Stability at ±0.1 °C/30 min) Flow: 1.8–2.2 L/min, Pressure: Approx. 0.05–0.15 MPa Inlet/Drain: Rc 3/8 (1 each)	
Compressed air		Air pressure	0.35–0.5 MPa
Stray magnetic field		Maximum 1.0 × 10 ^{–7} T or less	
Room	Ceiling height	220 cm or more (height of instrumentation: 199 cm)	
	Temperature	18–25 °C	
	Humidity	30–60 %RH	

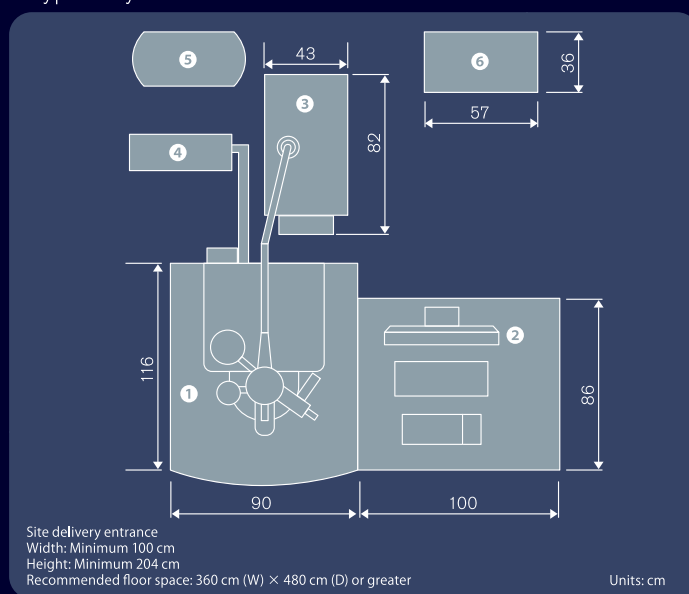
*1 : Resolution is guaranteed by specific cameras.
*2 : These features may vary depending on the options selected.
*3 : Not included in HT7830.
*4 : Included in HT7830.
*5 : Optional.

■ System appearance



with options

■ Typical layout



Items		Size (W×D×H, cm)	Weight (kg)
①	Column unit	90×116×199	677
②	Display unit	100×86×73	117
③	High-voltage transformer	43×82×77	230
④	Rotary pump	53×24×30	30
⑤	Air compressor	56×28×58	25
⑥	Chiller unit*5 (recommended)	57×36×104	80

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

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

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