



Scientific / Metrology Instruments  
Multi-purpose Electron Microscope

Solutions for Innovation

# *JEM-F200*

## *Multi-purpose Electron Microscope*

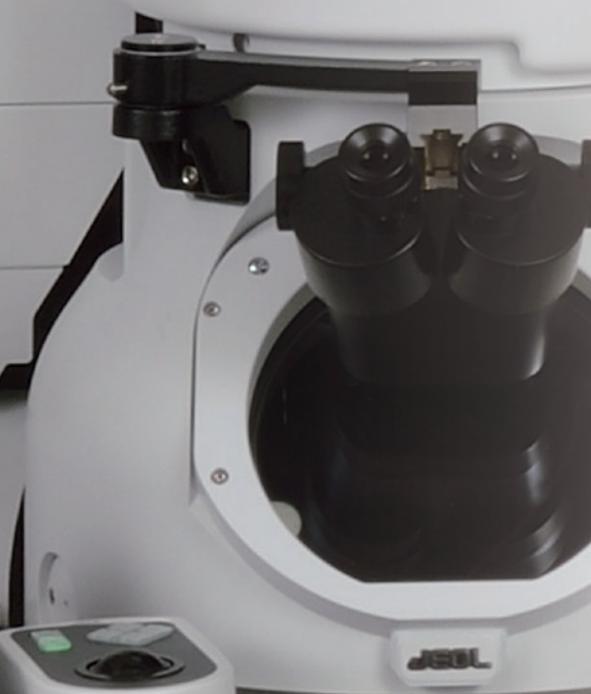
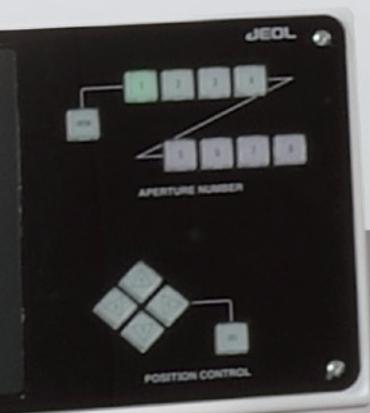
JEM-F200/F2 is a multi-purpose electron microscope of the new generation to meet today's diversified needs.

For F2, a user-oriented integrated-control-environment has been developed without sacrificing excellent performance and while maintaining a variety of functions.



JEOL Ltd.

MULTI-PURPOSE  
TRON MICROSCOPE

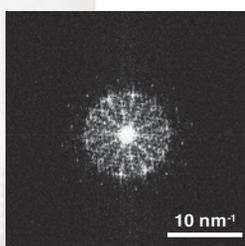
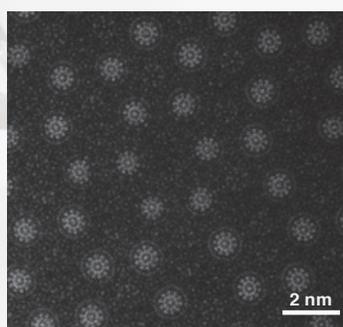


# Entirely revolutionized TEM

## F2

High-resolution analytical systems, such as transmission electron microscopes (TEM) and scanning transmission electron microscopes (STEM), are attracting increased attention. Higher resolution and higher efficiency are required for modern systems, along with upgraded ease of operation. To meet these needs, JEM-F200 (nickname: F2) has been developed as a next-generation electron microscope.

### High resolution STEM HAADF image

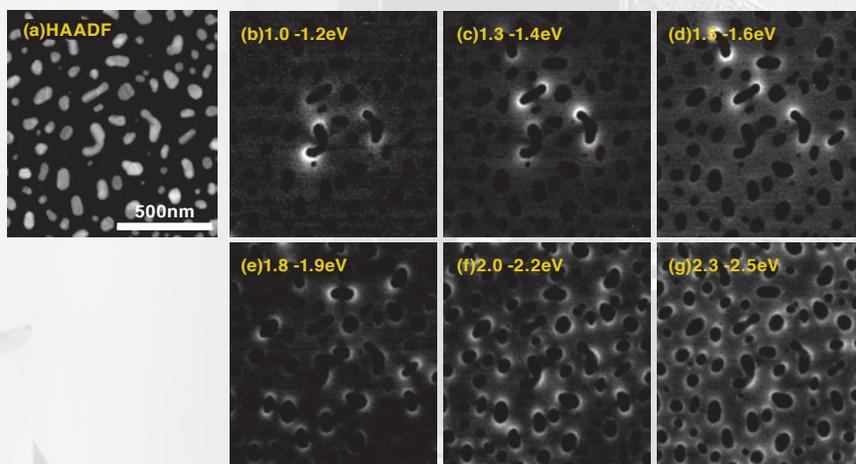


STEM-HAADF image

Specimen: Quasicrystal

(courtesy of Professor Emeritus K. Hiraga, Tohoku University)

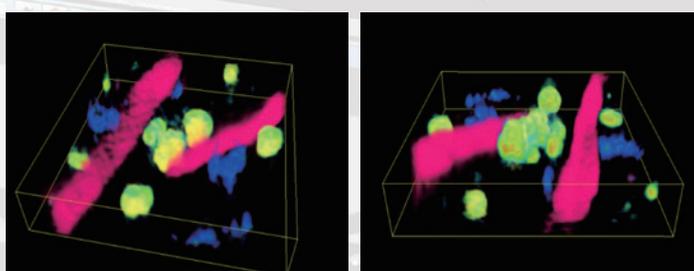
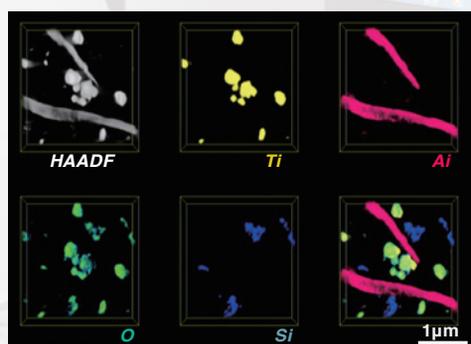
### Surface plasmon resonance by STEM-EELS\* with DeScan system\*



Wide Field STEM-EELS spectra

Specimen: Ag nanoparticles  
(courtesy of Dr. T. Sannomiya,  
Tokyo Institute of Technology)

### 3D-EDS tomography\*



3D EDS Tomograph

Specimen: Paint thin section

\* option

Fun to use from

# JEM-F200 / Multi-purpose Electron

## Smart design

>>The operation and appearance of F2 have been built under the design concept "Smart".

A new user interface focusing on intuitive operation has been developed for analytical electron microscopy.

By applying knowledge of mechanical and electrical stabilities accumulated over the long history of JEOL to the design of F2, the stability of the new TEM has dramatically improved.

## Quad-Lens condenser system

>>Modern TEMs must satisfy a wide range of applications, including bright-field (BF) & dark-field (DF) TEM and STEM, as well as analysis from various types of detectors.

To meet such sophisticated needs, F2 incorporates the Quad-Lens condenser system to realize independent control of electron-beam intensity and convergence angle.

## Advanced Scan system

>>F2 is equipped with a new scanning system "Advanced Scan System", which incorporates a descan system in the imaging lens system in addition to the standard probe scanning mechanism. This achieves a wide-field energy filtered STEM.

## Pico Stage drive

>>F2 comes with an ultra-fast, high-precision "Pico stage drive", as well as a super-high-precision piezo drive mechanism.

This enables the operator to move a field-of-view smoothly over a wide spatial-scale range from millimeters to picometers.

# Microscope

## SPECPORTER

>>F2 incorporates an automated mechanism "SPECPORTER" for smoother holder insertion and retraction. The mechanism allows us to insert or extract a specimen holder by simply pushing a button.

## Improved Cold FEG\*

>>F2 is equipped with an improved cold FEG (cold field emission gun) as an electron source. The narrow energy spread of the CFEG enables high-energy resolution EELS, which may identify chemical-bonding states of specimens. A high brightness and stable electron beam produced from the CFEG enables dramatically-reduced analysis time. Good temporal and spatial coherence from the CFEG provides higher quality atomic resolution images.

## Dual SDD\*

>>Two large-solid angle silicon drift detectors (SDDs) with high analytical sensitivity can be simultaneously installed into the microscope column, leading to X-ray analysis with higher sensitivity and throughput.

## Environmental friendly

>>F2 is the first TEM to come with an ECO mode. The ECO mode system saves energy when the instrument is not used by keeping the microscope under good standby conditions.

This mode suppresses energy consumption to approximately 1/5 of that compared to when the microscope is used.

A scheduling function is also included in the ECO mode that allows the microscope to be recovered from ECO mode to ready-to-use states at a designated time.

\* option

## Specifications

Resolution <sup>*1</sup>	Point to point	0.19 nm
	TEM lattice image	0.10 nm
	STEM-HAADF image	0.14 nm
Magnification <sup>*1</sup>	TEM: ×20 to ×2.0 M	
	STEM: ×200 to ×150 M	
Electron gun	Schottky field emission gun or Cold field emission gun	
Accelerating voltage <sup>*2</sup>	20 to 200 kV	
Max. specimen tilt angle	±80° (with Specimen High Tilting Holder)	
Optional accessories	Energy Dispersive X-ray Spectrometer (EDS), Electron Energy Loss Spectrometer (EELS), Digital Camera	

\* 1 When CF-UHR is configured.

\* 2 Standard voltages are 200 kV and 80 kV.

## Installation Room Requirements

Room temperature	5 to 25 °C (drift 1 °C/h or less)
Humidity	60% or less
Microscope power supply	Single phase 200 V, 10 kVA
Cooling water	Flow rate: 10 L/min. Temperature: 15 to 20 °C (fluctuations 0.1 °C/h or less)
Footprint	4,000 mm (W) × 5,000 mm (D) or more
Ceiling height	With TFEG: 3,000 mm or more, With CFEG: 3,200 mm or more
Entrance	1,000 mm (W) × 2,000 mm (H) or more

		Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
Microscope main console	With TFEG	2,633	1,279	1,248	1,900
	With CFEG	2,763	1,279	1,248	2,100
High-voltage tank	With TFEG	1,639	1,000	1,210	480
	With CFEG	1,719	1,000	1,300	570
PS console		1,750	570	800	322
Card console		1,750	570	800	112
LD console		900	700	456	60
Rotary pump		270	470	180	25
Air compressor *		514	415	210	16

\* The optional air compressor can be used only in Japan.

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