Solutions for Innovation

JEOL

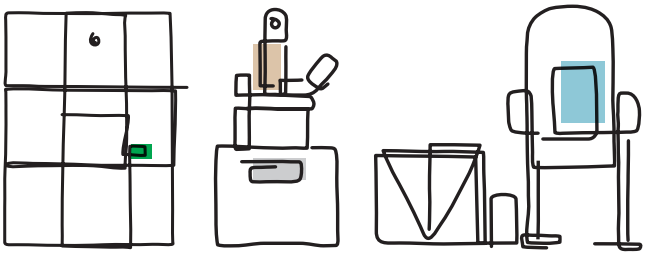
JEOL Products Guide

Products Guide 2026

Nanometrology

Fabrication

Characterization



JEOL Ltd.

Introduction

Thank you for your interest in JEOL products and services.

JEOL designs and manufactures scientific instruments for high-level research and development activities. Our customers include scientists and engineers working in leading-edge academic and industrial laboratories around the world. JEOL products and services enable them to pursue a variety of R&D applications that require high resolution imaging and analytical capabilities such as: basic observation and analysis, environmental science, information technology, semiconductor production, biotechnology, nanotechnology, and a broad range of industrial endeavors.

Experts involved in the studies of medicine, biology, biochemistry, agriculture, materials science, metallurgy, ceramics, chemistry, petroleum, pharmacy, semiconductors and electronic materials have been using JEOL products for more than 75 years. Our new products are easier-to-use than ever before and contribute to a high level of quality assurance and quality control during the production process.

This Product Guide presents the most current high-performance solutions from JEOL to meet your R&D requirements for electron optics, analytical, semiconductor, and industrial instruments and equipment. For more details or information about any of our products, please contact your nearest JEOL office.

JEOL Ltd.

Company Profile

Name: JEOL Ltd.
Address (head office): 1-2, Musashino 3-chome, Akishima, Tokyo 196-8558,
Japan Establishment: May 30, 1949
Capital: 21,394 million yen (as of the end of March 2025)
Consolidated sales: 196,695 million yen (as of the end of March 2025)
Number of employees: 3,604 (for JEOL Group as of the end of March 2025)

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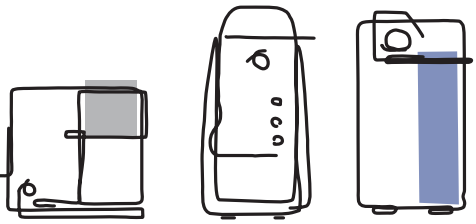

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Transmission Electron Microscopes

JEM-ARM300F2 GRAND ARM™2

Atomic Resolution Analytical Electron Microscope

The JEM-ARM300F2 GRAND ARM™2 is JEOL's flagship EM that combines ultrahigh spatial resolution observation and high sensitivity X-ray analysis at a wide range of accelerating voltages.
With the adoption of a new enclosure cover that can reduce the effect of environment changes as well as improved acoustic noise resistance of the column, the ultimate microscope stability has been realized.

- STEM Resolution: 0.053 nm (FHP2, 300 kV, with STEM Corrector)
- TEM Resolution: 0.050 nm (FHP2, 300 kV, with TEM Corrector)
- Accelerating voltage: 40 to 300 kV (Standard 80 kV, 300 kV)
- Electron gun: Cold field emission gun (CFEG)

JEM-ARM200F NEOARM

Atomic Resolution Analytical Electron Microscope

The JEM-ARM200F "NEOARM" comes with JEOL's unique cold field emission gun (Cold-FEG) and a new Cs corrector (ASCOR) that compensates for higher order aberrations. The combination of a Cold-FEG and ASCOR enables atomic-resolution imaging at not only 200 kV accelerating voltage, but also a low voltage of 30 kV.
"NEOARM" is also equipped with an automated aberration correction system. This system incorporates JEOL's new aberration correction algorithm for automatic fast and precise aberration correction.
JEOL delivers high-throughput atomic resolution images to everyone.

- STEM Resolution: 0.071 nm (UHR, 200 kV, with STEM Corrector)
- TEM Resolution: 0.07 nm (UHR, 200 kV, with TEM Corrector)
- Accelerating voltage: 30 to 200 kV (Standard 80 kV, 200 kV)
- Electron gun: Cold field emission gun (CFEG)

JEM-3300 CRYO ARM™ 300 II

Field Emission Cryo-Electron Microscope

The JEM-3300 "CRYO ARM™ 300 II" is a cryo-electron microscope that specializes in the observation of electron beam-sensitive specimens, such as proteins, for single particle analysis, tomography and MicroED. This system offers improved stability, throughput and ease of use compared to the previous generation of cryo-EMs. Moreover, this is an all-in-one system that can handle everything from screening to data acquisition, allowing for more flexibility in operation at customer sites to meet the needs of the facility. These improvements allow users to obtain high quality images by simple operation even for those who have never used an electron microscope before.

- Accelerating voltage: 300 kV
- Energy filter: In-column Omega energy filter
- Maximum tilt angle: ±70°
- Specimen cooling temperature: 105 K or less
- Specimen storage: Up to 12 specimens can be held.
- Electron gun: Cold field emission gun (CFEG)

JEM-Z200CA CRYO ARM™ 200 II

Field Emission Cryo-Electron Microscope

The JEM-Z200CA "CRYO ARM™ 200 II" is a cryo-electron microscope that specializes in single particle analysis used for 3D structure analysis of proteins, etc. In line with the JEOL CRYO ARM™ series, this system is equipped with a CFEG, an in-column energy filter, a side-entry liquid-nitrogen cooling stage and an automated specimen exchange system. The automated exchange system enables the storing of up to 12 samples and allows for the exchange of one or more samples, thus enabling flexible observation scheduling by multiple users. Moreover, this cryo-EM incorporates a newly-designed high-resolution pole-piece for acquiring higher-quality images.

- Accelerating voltage: 200 kV
- Energy filter: In-column Omega energy filter
- Specimen cooling temperature: 105 K or less
- Specimen storage: Up to 12 specimens can be held.
- Electron gun: Cold field emission gun (CFEG)

JEM-ACE200F

High Throughput Analytical Electron Microscope

The JEM-ACE200F is an automated electron microscope designed to enable data acquisition without continuous operator intervention using predefined workflow “Recipes.” This system-driven approach standardizes operation and significantly improves throughput and reproducibility. By incorporating core hardware technologies from the high-end JEM-ARM200F and the multi-purpose JEM-F200, the JEM-ACE200F delivers exceptional stability and advanced analytical performance.

- STEM Resolution: 0.10 nm (200 kV, with STEM Corrector)
- TEM Resolution: 0.10 nm (200 kV)
- Accelerating voltage: 60 to 200 kV (standard 80 kV, 200 kV)
- Electron gun: Cold field emission gun (CFEG)

JEM-F200

Multi-purpose Electron Microscope

The JEM-F200 (F2) is a next-generation, multi-purpose electron microscope designed for today’s diverse analytical needs. Featuring a new probe-forming lens system, cold field emission gun (CFEG), and Dual SDD system, it delivers high-resolution imaging and efficient, high-throughput materials analysis. The integrated SPECPORTER™ system enables automated holder insertion and retraction, ensuring smooth and reliable operation.

- STEM Resolution: 0.14 nm (UHR, 200 kV, CFEG)
- TEM Resolution: 0.19 nm (Point image, UHR, 200 kV, CFEG)
  0.10 nm (Lattice image, UHR, 200 kV, CFEG)
- Accelerating voltage: 20 to 200 kV (Standard 80 kV, 200 kV)
- Electron gun: Cold field emission gun (CFEG) /Thermal field-emission electron gun (TFEG)

JEM-2100Plus

Electron Microscope

The JEM-2100Plus is a multi-purpose transmission electron microscope, which combines the proven JEM-2100 optic system with an advanced control system for enhanced ease of operation. Achieving superior performance through intuitive operation, the JEM-2100Plus provides solutions to a wide range of applications from materials science to medical/biological studies.

- STEM Resolution: 1.0 nm (UHR, 200 kV)
- TEM Resolution: 0.14 nm (Lattice image, UHR, 200 kV)
- Accelerating voltage: 80 to 200 kV

JEM-120i

Electron Microscope

The JEM-120i is a 120 kV transmission electron microscope designed around the core principles of “Compact”, “Easy to Use”, and “Expandable”. With its modern design and intuitive operation, the JEM-120i streamlines workflows from routine imaging to maintenance—making high-quality TEM analysis accessible to users of all experience levels.

- TEM Resolution: 0.2 nm (Lattice image, HC)/0.14 nm (Lattice image, HR)
- Accelerating voltage: 20 to 120 kV
- Maximum tilt angle (Tilt-X): ±80° (HC/HR)

Note: The high tilt specimen holder is required as option.

Scanning Electron Microscopes

JSM-IT810
(SHL version)

JSM-IT810

Schottky Field Emission Scanning Electron Microscope

The JSM-IT810 Series represents the flagship of our SEM product line, enabling acquisition of ultra-high-resolution data with exceptional ease of use. Its superior performance is powered by advanced JEOL technologies, including an in-lens Schottky Plus field emission electron gun, the Neo Engine electron optical control system, and SEM Center instrument control software for seamless operation. The system can be equipped with a fully integrated JEOL energy-dispersive X-ray spectrometer (EDS), providing real-time elemental analysis to complement high-resolution imaging. In addition, no code automation tools are built-in for automating image and EDS analysis providing a streamlined and efficient workflow. Choose between three types of objective lens: a hybrid lens (HL), a super hybrid lens (SHL) and semi-in-lens (SIL). SHL and SIL each have two versions, standard and PRIME.

- Resolution: HL: 0.7 nm (20 kV), 1.3 nm (1 kV)
  SHL: 0.6 nm (15 kV), 1.1 nm (1 kV)
  SHL PRIME: 0.5 nm (15 kV), 0.7 nm (1 kV)
  SIL: 0.6 nm (15 kV), 1.0 nm (1 kV)
  SIL PRIME: 0.5 nm (15 kV), 0.7 nm (1 kV)
- Landing voltage: 0.01 to 30 kV
- Direct magnification: HL/SHL: ×10 to ×2,000,000 (128 × 96 mm print size)
  SIL: ×25 to ×2,000,000 (128 × 96 mm print size)
- Display magnification: HL/SHL: ×27 to ×5,480,000 (1,280 × 960 pixels on display)
  SIL: ×69 to ×5,480,000 (1,280 × 960 pixels on display)

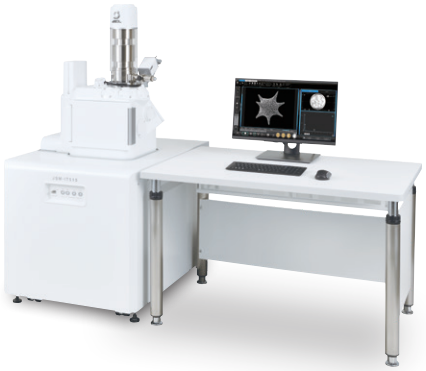
JSM-IT710HR

Scanning Electron Microscope

- Clear visibility promotes new discovery -

The JSM-IT710HR is the latest HR model, designed for effortless acquisition of high-resolution images. This model features seamless navigation from optical to SEM imaging, a new multi-segmented backscatter electron detector for live 3D imaging, and auto functions from alignment to focus for fast clear and sharp images. A new hybrid low vacuum secondary electron detector expands observation options by providing both a secondary and photon signal. Productivity enhancing no code automation functions are built-in for automation of image collection and includes EDS when JEOL's fully embedded EDS is configured with the system.

- Resolution: High vacuum mode: 1.0 nm (20 kV), 3.0 nm (1 kV)
  Low vacuum mode: 4.0 nm (30 kV, BED)
  Analysis performance: 3.0 nm (15 kV, probe current 3 nA)
- Landing voltage: 0.5 to 30 kV
- Direct magnification: ×5 to ×600,000
  (defined with a print size of 128 × 96 mm)
- Display magnification: ×15 to ×1,767,305, Image magnification on the monitor
  (defined with a display size of 377 × 283 mm)



JSM-IT510

Scanning Electron Microscope

The JSM-IT510 is the most versatile of our thermionic-emission SEMs and comes with a large multipurpose chamber that can accommodate large specimens (200 mm dia.). This multipurpose SEM with smart analytical port design can accommodate not only multiple EDS but also EBSD and WDS etc. This JSM-IT510 can also be equipped with a LaB_6 electron gun, for applications requiring higher brightness and longer source lifetimes.

- Resolution: High Vacuum Mode: 3.0 nm (30 kV), 15.0 nm (1 kV)
  2.0 nm (30 kV), 12.5 nm (1 kV) *LaB_6 electron gun
  Low Vacuum Mode: 4.0 nm (30 kV, BED)
  3.0 nm (30 kV, BED) *LaB_6 electron gun
- Landing voltage: 0.3 to 30 kV
- Direct magnification: ×5 to ×300,000 (print size of 128 × 96 mm)
- Display magnification: ×14 to ×839,724 (display size of 358 × 269 mm)

JSM-IT210

Scanning Electron Microscope

- Guided operation for necessary data acquisition -

The JSM-IT210 series is our compact thermionic-emission SEM that delivers exceptional performance at a great value. The JSM-IT210 allows for seamless navigation from optical to SEM imaging, Live EDS, Live 3D and auto functions from alignment to focus for fast, clear, and sharp images. Productivity enhancing automation is included to simplify workflow so that you can focus on results.

- Resolution: High vacuum mode: 3.0 nm (30 kV), 15.0 nm (1 kV)
  Low vacuum mode: 4.0 nm (30 kV, BED)
- Landing voltage: 0.3 to 30 kV
- Direct magnification: ×5 to ×300,000 (defined with a print size of 128 × 96 mm)
- Display magnification: ×15 to ×883,652 (full screen display by standard monitor)

JCM-7000 NeoScope™

Benchtop Scanning Electron Microscope

The JCM-7000 is a benchtop scanning electron microscope with guided workflow and advanced auto functions that provides easy imaging and analysis for users at all experience levels. This versatile benchtop SEM includes high vacuum (HV) mode for observation of sub-micron structures and low vacuum (LV) for observation of non-conductive specimens in their native state. The JCM-7000 is now equipped with no code automation popular with our higher-end SEM models for enhanced efficiency and throughput.

- Direct magnification: ×10 to ×100,000 (Magnification is defined by 128 × 96 mm)
- Monitor magnification: ×24 to ×202,168 (Magnification is defined by 280 × 210 mm)
- Specimen size: 80 mm diameter
- Main options: EDS (energy dispersive X-ray spectrometer),
  Stage Navigation System, Tilting and Rotating Motor Drive Holder

Ion Beam Application Equipment

JIB-PS500i
FIB-SEM System

The JIB-PS500i combines high-resolution SEM imaging with a high-performance FIB to enable precise, site-specific TEM specimen preparation. A large specimen stage with wide tilt capability simplifies workflows such as block trimming, while the Check & Go function—featuring a newly developed STEM detector—allows rapid screening of prepared samples. With compatibility for double-tilt cartridges and TEM holders, the system ensures seamless correlation between FIB processing and TEM analysis.

- SEM resolution: 0.7 nm at 15 kV, 1.4 nm at 1 kV, 1.0 nm at 1 kV in BD mode
- FIB resolution: 3 nm at 30 kV
- FIB probe current: 1 pA to 100 nA

JIB-4700F
MultiBeam System

The JIB-4700F features a hybrid conical objective lens, GENTLEBEM™ (GB) mode and an in-lens detector system to deliver a guaranteed resolution of 1.6 nm at a low landing voltage of 1 kV. Using an In-Lens Schottky FEG that produces an electron beam with a maximum 300 nA probe current, this new FIB-SEM allows for high-resolution imaging and fast analyses. For the FIB column, a high-current density Ga ion beam with a maximum 90 nA probe current is employed for fast ion milling and processing of specimens.

- SEM image resolution: 1.2 nm (15 kV, GB mode), 1.6 nm (1 kV, GB mode)
- FIB image resolution: 4.0 nm (30 kV)
- FIB probe current: 1 pA to 90 nA

IB-19540CP
CROSS SECTION POLISHER™ (CP)

The IB-19540CP uses a broad argon ion beam milling source to produce pristine, artifact free cross sections. Milling rates as high as 1.2 mm/h (Si equivalent, edge distance 100 µm) can be achieved with its high throughput ion source. It is possible to perform planar surface milling over a wide area up to ~20 mm in diameter with the new rotation holder option. By connecting the system to a LAN, users can check the milling status over a web browser.

IB-19550CCP
Cooling CROSS SECTION POLISHER™ (CP)

The IB-19550CCP can employ a cooling function where beam sensitive specimens are cooled and maintained at a low temperature (-120 to 0 °C) while being exposed to the ion beam, thus minimizing heat damage. The unique design of the cooling function reduces the consumption of liquid nitrogen and allows for long milling times. Cooling and warming functions are automatic streamlining workflow.
In addition, a specimen can be set or removed even while the system has liquid nitrogen in the reservoir.

Peripheral Equipment

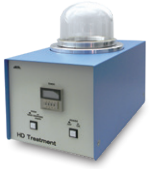
DrySD™
Energy dispersive
X-ray spectrometer

EC-52000IC
Ion Cleaner

SXES Series
Soft X-ray Emission
Spectrometer Series

JII-29080DMS
Dry Pumping Multi Station

JEC-3000FC
Auto Fine Coater



DII-29020HD
HD Treatment

EC-32010CC
Carbon Coater

DII-29010SCTR/DII-29030SCTR
Smart Coater

SM-92100EUVC
Excimer UV Cleaner

miXcroscopy™
Linked Optical and Scanning
Electron Microscope System

Instruments for Microarea and Surface Analysis

JXA-iHP200F

Electron Probe Microanalyzer

The JXA-iHP200F represents the next generation of Electron Probe Microanalyzer (EPMA) technology. Its Schottky field emission electron source delivers exceptional imaging and analytical resolution, combined with high and stable probe current for ultimate analytical performance. A flexible, fully customizable configuration of spectrometers and crystals allows the system to be precisely tailored to specific application requirements. The JXA-iHP200F supports panchromatic or fully quantitative hyperspectral cathodoluminescence (CL), and can be equipped with JEOL's Soft X-ray Emission Spectrometer (SXES) for advanced chemical state analysis and ultra-light element detection.

JXA-iSP100

Electron Probe Microanalyzer

The JXA-iSP100 is a highly versatile Electron Probe Microanalyzer (EPMA) that delivers high-resolution imaging and reliable analytical performance, supported by a high and stable probe current. Designed for flexibility, the system can be configured with either a tungsten (W) or LaB_6 electron source to suit a wide range of applications. A streamlined workflow, combined with customizable spectrometer and crystal configurations, enables efficient optimization for diverse analytical needs. The JXA-iSP100 supports panchromatic or fully quantitative hyperspectral cathodoluminescence (CL), and can also be equipped with JEOL's Soft X-ray Emission Spectrometer (SXES) for chemical state analysis and ultra-light element detection.

JAMP-9510F

Field Emission Auger Microprobe

The JAMP-9510F is a high-performance field-emission Auger microprobe designed for advanced surface analysis. It delivers high-throughput chemical-state characterization through a hemispherical electrostatic energy analyzer (HSA), while maintaining large probe currents even at small probe diameters enabled by its field emission gun (FEG). A eucentric tilt stage combined with an integrated charge neutralization gun allows reliable analysis of both conductive and insulating materials. With its capability to provide detailed chemical composition and chemical-state information, the JAMP-9510F offers comprehensive surface characterization for a wide range of samples.

JPS-9030

Photoelectron Spectrometer (XPS)

The JPS-9030 is a multi-purpose XPS adopting newly-developed software for greater ease-of-use. A new Kaufman-type etching ion source is installed in the specimen exchange chamber to prevent contamination of the measurement chamber. In addition to the standard Mg/Al twin anode, an infrared heating system and an Ar gas cluster ion source are available.

X-ray Fluorescence Spectrometers

JSX-1000S

Energy-dispersive X-ray fluorescence spectrometer

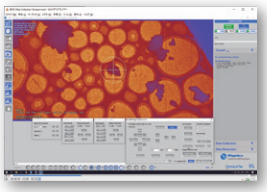
The JSX-1000S is an energy dispersive X-ray fluorescence spectrometer that provides high-sensitivity and high-throughput analysis across its entire energy range and can employ up to nine filters. Features include built-in recipes which automate analyses based on specific applications or sample categories (ex. ROHS), Smart FP method for accurate standard-less quantitative analysis and helium-free light element analysis in liquid by utilizing our Low Vacuum Capsule option.

Electron Diffractometer

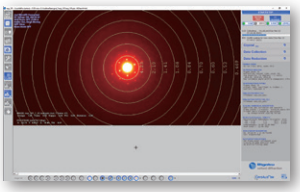
XtaLAB Synergy-ED

Electron Diffractometer

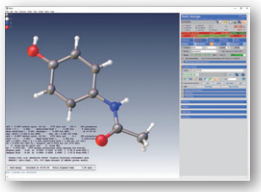
The XtaLAB Synergy-ED is a new and fully integrated electron diffractometer that uses electron beams to create a seamless workflow from data collection to structure determination of three-dimensional molecular structures. The XtaLAB Synergy-ED is the result of combining core technologies to achieve synergy between Rigaku's high-speed, high-sensitivity detector (HyPix-ED) and single crystal analysis software (CrysAlis^{Pro} for ED) and JEOL's transmission electron microscope technology. By creating a seamless workflow from sample selection (nanocrystals) to data collection and structure analysis, the XtaLAB Synergy-ED makes electron diffraction easily accessible to non-experts who do not have the expertise in electron microscopy and crystallography that is typically required.



❶ Select the target crystal

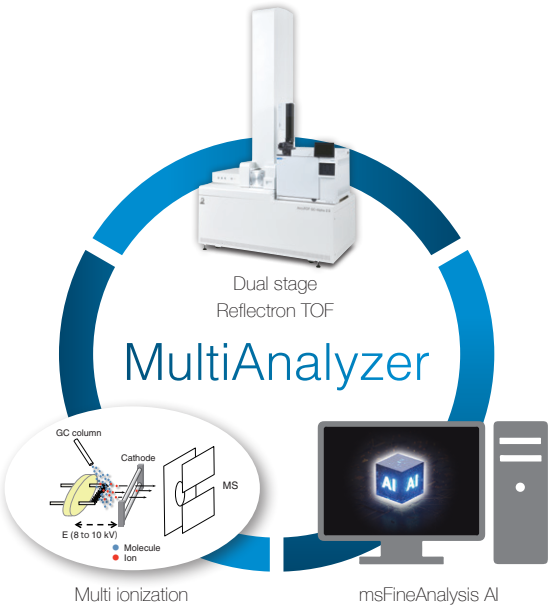


❷ Measure and analyze using electron diffraction



❸ Analyze crystal structure

Mass Spectrometers



JMS-T2000GC MultiAnalyzer

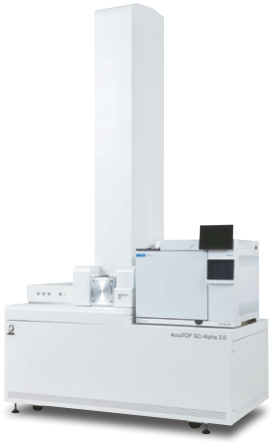
Multi-ionization Unknown Compounds Analysis System

Materials are getting more complex, our environment is diversifying, and hundreds of new chemicals are created every day. The Multi-ionization Unknown Compounds Analysis System MultiAnalyzer performs structure analysis even for unknown compounds and provides answers to such complicated and challenging problems. We are committed to provide high throughput, high quality analysis results with MultiAnalyzer.

JMS-Q1600GC UltraQuad™ SQ-Zeta

Gas Chromatograph - Quadrupole Mass Spectrometer (GC-QMS)

JMS-Q1600GC UltraQuad™ SQ-Zeta is our 6th generation high-end gas chromatograph quadrupole mass spectrometer (GC-QMS) based on JEOL's MS technologies and years of in-depth experience. The IDL of the standard EI ion source is 5 fg (OFN) or less. The msFineAnalysis IQ, a new qualitative analysis software that realized the EI/Soft Ionization integrated analysis on GC-QMS data, takes the qualitative analysis using GC-QMS to a new level. From quantitative applications such as environmental samples, water quality control and agrochemicals, to qualitative applications such as materials and aroma analyses, the SQ-Zeta is the ultimate general-purpose GC-MS with high-performance capabilities for a wide variety of measurement and analysis needs.



JMS-T2000GC AccuTOF™ GC-Alpha 2.0

Gas Chromatograph - Time-of-Flight Mass Spectrometer

The JMS-T2000GC AccuTOF™ GC-Alpha 2.0 is a high-performance GC-MS system that features high mass resolution, high mass accuracy, high sensitivity, high speed data acquisition, wide dynamic range, and wide mass range. Two types of multi-ionization combination ion sources - EI/FI/FD combination ion source and EI/PI combination ion source - are available. Soft ionization methods can produce molecular ions from unknown compounds whose molecular ions can not be produced by EI, and facilitate the elucidation of their elemental compositions. The system comes with the automatic structure analysis software "msFineAnalysis AI" for integrated structure analysis of the data measured by the multi-ionization combination ion sources, thus providing fast automatic structure analysis, which does not solely depend on mass spectral library databases.

JMS-TQ4000GC UltraQuad™ TQ

Gas chromatograph - Triple Quadrupole Mass Spectrometer (GC-QMSMS)

The new GC triple quadrupole mass spectrometer that provides both high productivity and highly sensitive analysis with the combination of JEOL's proprietary short collision cell technology and the ion ejection technology (ejecting ions after accumulating and pulsing them). It exerts its capabilities in the quantitative analysis of trace target compounds in high matrix samples, such as pesticides residues in foods. Further trace analysis is possible by using an optional ion source such as the Enhanced Performance Ion Source (EPIS).

Photo: JMS-Q1600GC + Headspace autosampler system

MS-62071STRAP

Headspace Autosampler

The MS-62071STRAP is a new-generation headspace sampler (HS) employing sorptive trap and providing ultra-high sensitivity measurement, which was not possible with the conventional HS sampler using a sample loop. In addition, the HS-GCMS system, combined with a JMS-Q1600GC, guarantees detection of mold odor in water down to 1 ppt.

JMS-S3000 NewSpiralTOF™

Ultra-High Mass-Resolution MALDI-TOFMS System

The JMS-S3000 NewSpiralTOF™ is a MALDI-TOFMS* featuring innovative SpiralTOF ion optics. Upgraded to NewSpiralTOF™, it further extends the mass range in SpiralTOF mode and enhances mass spectrometry imaging speed. Setting a new benchmark in MALDI-TOFMS performance, the JMS-S3000 delivers state-of-the-art analytical solutions for diverse research fields, including functional synthetic polymers, materials science, and biomolecules.

* matrix-assisted laser desorption/ionization time-of-flight mass spectrometer

JMS-T100LP AccuTOF™ LC-Express

Atmospheric Pressure Ionization High-Resolution Time-of-Flight Mass Spectrometer

The JMS-T100LP AccuTOF™ LC series of atmospheric pressure ionization time-of-flight mass spectrometers are robust, easy-to-maintain, high-throughput mass spectrometers intended for high productivity with multiple ionization methods. The AccuTOF™ LC-Express is the advanced version of JMS-T100LP with a significantly improved dynamic range. By using Direct Analysis in Real Time (DART™), which is JEOL's proprietary ionization technology of rapidly providing accurate mass information, as well as easy replacement of the ion source with the electrospray ionization (ESI) source for LC-MS operation or with the ColdSpray ionization (CSI) source, the AccuTOF™ LC-Express satisfies various research needs in organic chemistry, material science, and other fields.

JMS-T100LP + DART™ Ion Source

Ambient Ionization High-Resolution TOFMS

Direct Analysis in Real Time (DART™) is an ion source that can analyze samples with various shapes and states without any sample preparation. DART™ was born in 2003 at the mass spectrometry applications laboratory of JEOL USA, Inc. Among a series of new ionization techniques, which were later termed "ambient ionization," DART™ was the first to have been invented and the first to have been commercialized in 2005. It is possible to acquire high mass-resolution, accurate-mass spectra in real time by simply presenting samples of various shapes and states to the DART™ ion source without any sample preparation. DART™ can handle samples with arbitrary shapes or "dirty" samples that conventional analytical methods struggle. DART™ was developed for the JEOL AccuTOF™ series of mass spectrometers. AccuTOF™ LC-Express and DART™ are the perfect combination.

NMR Spectrometers

JNM-ECZL (ECZ Luminous™) series

FT NMR System

The JNM-ECZL series (ECZ Luminous™) is an FT NMR system equipped with state-of-the-art digital and high-frequency technologies. The highly integrated Smart Transceiver System, a high-speed, high-precision digital high-frequency control circuit, enables further miniaturization and ensures the stability of spectrometer. The new Multi Frequency Drive System enables multi-resonance measurements in a standard configuration, providing a wider range of solutions.

ECZL G series

This is a flagship model that supports diversified, cutting-edge applications, including high-magnetic-field, and solid-state NMR measurements. The system is flexible in terms of expansion, with support for three or more channels, high-power amplifiers, and high-power magnetic field gradients.

- Frequency: 400 MHz to 1.3 GHz
- Sample type: solution/solid
- Number of channels: 2 (standard), expandable up to 8 channels
- Power amplifier: High frequency side
  400 to 600 MHz, 100 W, 700 MHz or higher, 200 W
  500 W/1000 W (as an option)
  Low frequency side
  400 to 600 MHz, 300 W, 700 MHz or higher, 500 W
  1000 W/2000 W (as an option)
- Magnetic field gradient amplifier: 10 A (standard), 30 A/50 A (as an option)

ECZL R series

This is a compact model that supports solid-state NMR measurements. Its footprint is less than 50% of the spectrometer of JNM-ECZR.

- Frequency: 400 MHz to 600 MHz
- Sample type: solution/solid
- Number of channels: 2
- Power amplifier: High frequency side 100 W, Low frequency side 300 W
- Magnetic field gradient amplifier: 10 A

ECZL S series

This is an entry-level model dedicated to 400 MHz solution NMR while incorporating the high-performance digital high-frequency technology of the ECZL series.

- Frequency: 400 MHz
- Sample type: solution
- Number of channels: 2
- Power amplifier: High frequency side 50 W, Low frequency side 150 W
- Magnetic field gradient amplifier: 10 A

Cryogen Reclamation System (CR80)

CR80

Cryogen Reclamation System

The CR80 is an attachment that can greatly reduce the cryogen evaporation of both liquid helium and liquid nitrogen which are inevitable for superconducting magnets for NMR. This system will greatly help in the management of cryogens for NMR system by eliminating concerns about follow-up services as it is an in-house product, concerns about unstable supply of cryogens, price increases, and scheduling of filling operations. We also have the “NR-50” which is a system to reduce evaporation of liquid nitrogen and the “NS-20W-J” which is an auto supplier of liquid nitrogen allowing for liquid nitrogen to be taken out.

Nitrogen Replenishment System (NR-50)

Liquid Nitrogen Generator (NS-20W-J)

Solution NMR probe

Solution NMR probe

In solution NMR, samples dissolved in a solvent are measured by placing them in glass tubes. A wide variety of probes can be provided depending on the magnet size, target nuclei, and sample tube size. The newly developed cooling type probe, SuperCOOL MARVEL probe offers a dramatic improvement in sensitivity compared with conventional probes of the same class. It is user-friendly broadband type, enabling high sensitivity measurements across multiple nuclei. This probe is suitable not only for routine measurements, but also for advanced application experiments.

SuperCOOL MARVEL probe

Solid-state NMR probe

Solid-state NMR accessories

In solid-state NMR, solid-state samples such as powders and films are placed in a dedicated ceramics sample tube for measurement. The solid-state NMR technique is effective for analyzing samples that do not dissolve in solvents such as inorganic materials, and crystalline polymorph that can be meaningfully measured in the solid state. Use of AUTOMAS probe, ROTORCARRIER™, and auto sample changer enables automatic measurement of multiple samples like solution NMR.

ROTORCARRIER™ for AUTOMAS probe

ESR Spectrometers

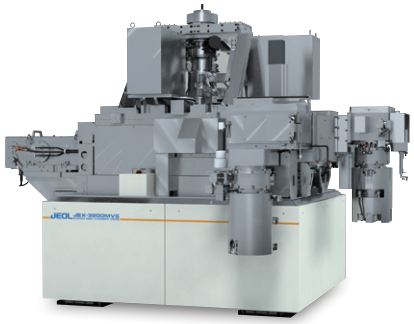
JES-X3 series

ESR Spectrometers

Recently, it has been widely accepted that even relatively few unpaired electrons in a sample can affect the function of the material, so a lower detection limit (higher sensitivity) is required of ESR measurements. The JES-X3 Series has achieved higher sensitivity by developing a low-noise Gunn oscillator for its new spectrometer.

	X310	X320
Maximum Magnetic Field	0.65 T	1.3 T
Sweep Width	±0.01 to 250 mT	±0.01 to 500 mT
Pole Gap	60 mm	60 mm
Frequency Range	8,750 to 9,650 GHz	
Field Resolution	2.35 μT	
Correction by Marker	Standard	

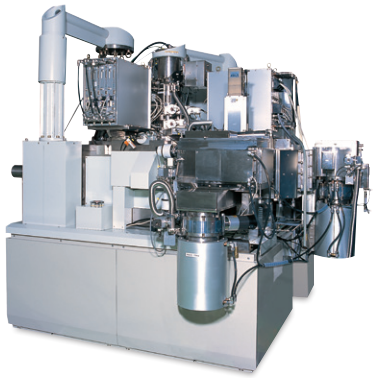
Semiconductor Equipment



JBX-3200MVS
Electron Beam Lithography System

The JBX-3200MVS is a variable-shaped electron beam lithography system for mask making of 32 nm to 28 nm nodes. Its advanced technology achieves high speed, high precision and high reliability. This EB system uses a variable-shaped 50 kV electron beam and a step-and-repeat specimen stage.

- High throughput enabled by a new PEC (Proximity Effect Correction) system
- High-speed data-transfer system for a large quantity data
- High-precision design for mask/reticle production



JBX-3050MV/S
Electron Beam Lithography System

The JBX-3050MV/S is a variable-shaped electron beam lithography system for mask making up to the 45 nm nodes. Its advanced technology achieves high speed, high precision and high reliability. This EB system uses a variable-shaped 50 kV electron beam and a step-and-repeat stage.

JBX-A9
Electron Beam Lithography System

The JBX-A9 is a spot-beam e-beam lithography system for 300 mm wafers that inherits the basic specifications of the JBX-9500FS while achieving power and space savings and is environmentally friendly through the use of a refrigerant-free chiller. This system is suitable for applications that require particularly high beam positioning accuracy, such as photonic crystal device fabrication.

- Accelerating voltage: 100 kV
- Electron beam source: ZrO/W Schottky emitter
- Scanning speed: 200 MHz to 250 Hz
- Substrate size: Maximum 300 mm wafer

JBX-8100FS
Electron Beam Lithography System

The JBX-8100FS is a spot-beam e-beam lithography system that performs superior accuracy and writing speed. Upgradable platform offers various options to meet the fields from high-end nanostructure applications to batch production of compound semiconductor.

- Accelerating voltage: 100 kV (option: 200 kV/130 kV/50 kV/25 kV)
- Electron beam source: ZrO/W Schottky emitter
- Scanning speed: 125 MHz to 250 Hz
- Substrate size: Maximum 200 mm wafer

Metal AM Machine

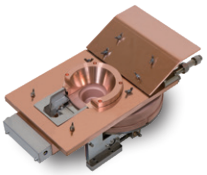
JAM-5200EBM

Electron Beam Metal 3D Printer

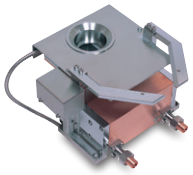
Metal 3D printer that employs additive manufacturing with powder bed fusion techniques. This 3D printer irradiates the laid metal powders with an electron beam to melt and solidify the powders for fine-structure production. The features of the printer include direct manufacturing of 3D micro-structures, and large-output, high-speed, high-density manufacturing, thus allowing for additive manufacturing with high quality and high reproducibility.

- Manufacturing dimensions: Maximum 250 mm (dia.) × 400 mm (H)
- Electron beam output: Maximum 6 kW

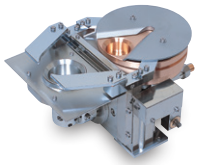
Industrial Equipment for thin-film formation and material processing



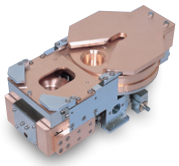
BS-60211DEM



BS-60060DEBS



EBG-102UB6S



EBG-203UB6S

BS series/EBG series

Electron Beam Source

Electron beam sources for vacuum evaporation of thin-film deposition. Various models are selectable for oxide films, nitride films and metal films. Extended-use models are also available for multilayer films and continuous evaporation with the long-lifetime filament.

BS-60610BDS

BS-60310BDS

BS-60610BDS/BS-60310BDS

Bombardment Deposition Source

Deposition sources that utilize electron-beam bombardment indirect heating techniques. Suitable for low-damage, low-defect, low-absorption film evaporation. The BS-60610BDS achieves large capacity and high rate for liners.

Industrial Equipment for thin-film formation and material processing

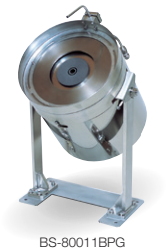
JEBG-3000UB

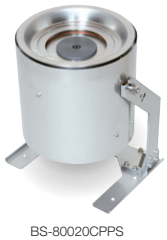
JEBG-1000UB

JEBG series

High-power Electron Beam Source

High-power electron beam sources for vacuum evaporation of metal and metal-oxide for wide plastic films or large glass plates that are continuously fed. They can also be used for vacuum melting of high-melting point metals.


BS-80011BPG


BS-80020CPPS

BS-80011BPG/BS-80020CPPS

Plasma Source

Plasma Sources are installed in a vacuum chamber and generate high-density plasma. Used for Ion Plating (Plasma Assisted Deposition) and it is possible to improve film properties for optical thin films, protective films and functional films. Because high density plasma can be generated in a mass space, high-rate deposition to a large area is possible.

BS-04 series

Rotary Sensor

Multi-point sensor for measuring the deposition rate and film thickness in vacuum evaporation or sputtering by connecting it to a quartz-rate control monitor. Equipped with 6 or 12 quartz crystals, smooth crystal replacement is achieved for deposition of multilayer or thick films. Sensor length in the chamber is selectable and two kinds of sensor-head angle are available, thus enabling flexible sensor installation into small to large equipment.

BS series

Electron Beam Source for research and development

Electron beam source suitable for research and development. Various optional accessories can be added for a wide range of customization, including lift-off evaporation with low temperature, low damage, low defect, etc.

TP-40020NPS Nano-powder synthesis system

TP series

RF Induction Thermal Plasma System

Thermal plasma around 10,000 °C by RF inductive coupling. Applications of the thermal plasma system include nano-powder synthesis, fine-powder spheroidization, high-speed thick-film synthesis and gas decomposition. Irrespective of materials and gases, chemical reactions (oxidization, nitriding) and surface reforming can be made.

TP-99260FDR

Powder Feeder

The table-type powder feeder that can stably feed minute particles of various sizes ranging from submicron to 100 µm or larger. It feeds particles using carrier gas through the piping. Even particles of a few microns or less in size that are highly cohesive and therefore poor in fluidity can be fed continuously. The powder feeding rate is approximately from 0.1 to 100 g/min. The closed structure enables feeding into a reduced-pressure atmosphere. Not only single-composition particles but also mixed-composition particles can be fed continuously without changing the mixing ratio. It also supports real-time monitoring of powder feeding, feedback, and external control.

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