JXA-8530F

Field Emission
Electron Probe Microanalyzer

禹重科技® ÜZONGLAB
成分分析仪器|表面测试仪器|样品前处理仪器

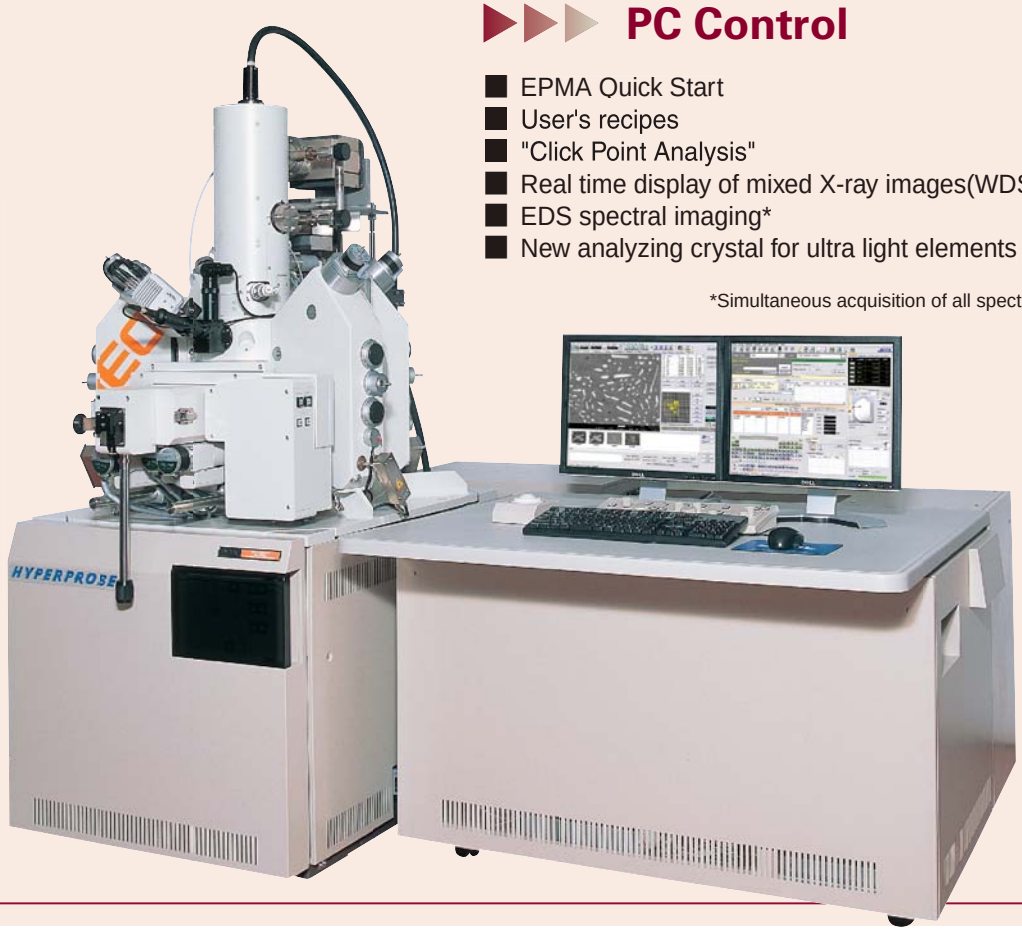
JEOL
Serving Advanced Technology

HYPER PROBE **JXA-8530F**

A PC Controlled, WD/ED Combined System Opens Doors to New Ultra Micro Analysis

JEOL revolutionized surface analysis with an EPMA featuring a field emission (FE) electron gun, and now is proud to present a new upgraded FE-EPMA.

The JXA-8530F operates on PC Windows for data acquisition and analysis while maintaining the powerful hardware of the JXA-8500F including the FE electron gun, EOS, and vacuum system to achieve the ultra micro area analysis. User friendly, PC-based operation facilitate quick and easy analyses at the highest magnifications.



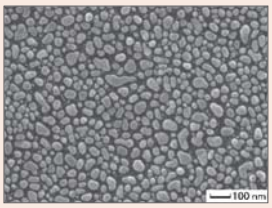
PC Control

- EPMA Quick Start
- User's recipes
- "Click Point Analysis"
- Real time display of mixed X-ray images(WDS)
- EDS spectral imaging*
- New analyzing crystal for ultra light elements

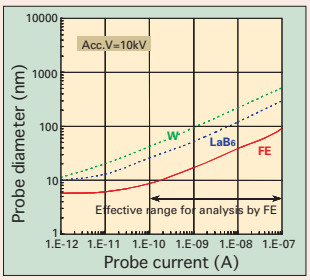
*Simultaneous acquisition of all spectra

High spatial resolution in X-ray mapping with the FE electron gun

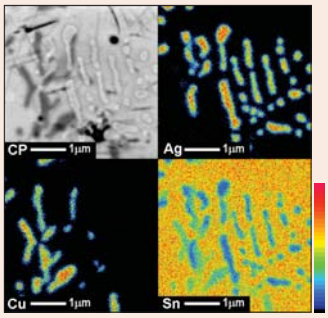
The FE electron gun produces a probe that is only 1/2 to 1/10 the size of that produced in a thermionic-emission electron gun in a conventional EPMA, using a W filament or a LaB_6 tip.



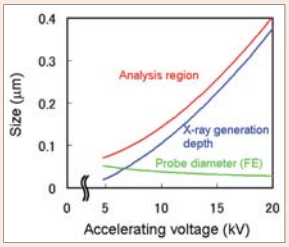
Secondary electron image of gold particles (100,000×).



Probe diameter versus probe current in different guns using 10 kV accelerating voltage.



Backscattered electron image (CP) and X-ray maps of lead free solder (20,000×, 6 kV, 10 nA)

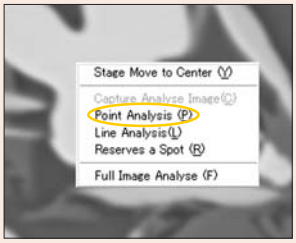


Probe diameter, area of X-ray generation, and analytical area (X-ray spatial resolution) relative to kV in a FE electron gun.

The FE electron gun is capable of producing a micro probe at low accelerating voltage even with high probe currents(10 to 100 nA), allowing for WDS analyses with high X-ray spatial resolution.

"Click Point Analysis", User's Recipes

"Click Point Analysis" allows the user to acquire qualitative WDS spectra and semi-quantitative analyses simply by clicking a point on a secondary electron or backscattered electron image. User's Recipes provides for easy access to preset analytical conditions. These features are designed to maximize the efficiency of the FE-EPMA with the simplest of operations.

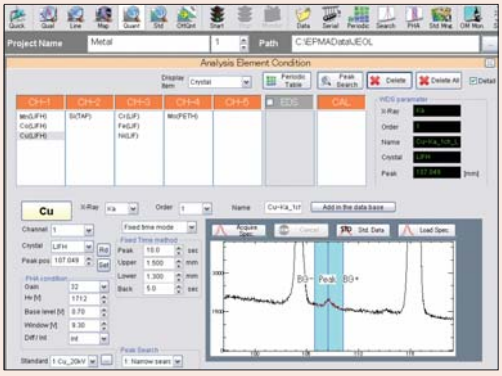


"Click Point Analysis" Selecting Point Analysis will activate WDS qualitative analysis.

Selecting User's Recipes

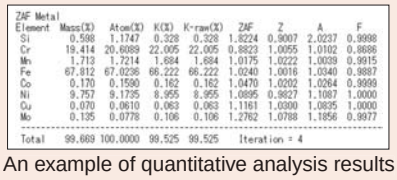
Advanced Operation

A user can design detailed analytical procedures tailored to their research objective, such as complex quantitative elemental analysis of nano-size areas. Also integrated into the system are a complete line of applications and easy-to-use software packages that provide for extensive data analysis methods and tools. For example, Probe Tracking is provided making it easier to perform long duration area and spot analyses on extremely small features without concern for beam drift.

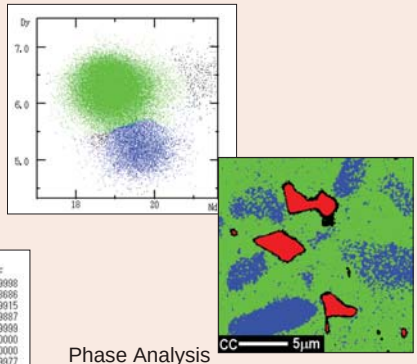


EPMA control software
(Settings windows for quantitative analysis conditions)

Probe Tracking



An example of quantitative analysis results

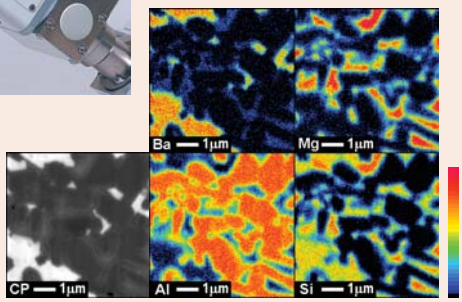


Phase Analysis
(scatter diagram and phase map)

Combined WD/ED System

The JXA-8530F has a user friendly combined WD/ED system incorporating JEOL's advanced WDS and EDS detectors. Combining the WDS for trace element analysis and JEOL's proven EDS, the JXA-8530F is a powerful tool for efficient data acquisition of quantitative analyses, high magnification beam scan mapping, and large area stage scan mapping.

SDD EDS detector("dry SD")



Backscattered electron image (CP) and combined WD/ED x-ray maps (Top : WDS ; Bottom : EDS)

Specifications

Detectable elements	WDS : (Be*) B to U, EDS : B to U
X-ray range	WDS : 0.087 to 9.3 nm, EDS energy range : 20 keV
X-ray spectrometers	WDS : 1 to 5 ; EDS : 1
Maximum sample size	100 mm × 100 mm × 50 mm (H)
Accelerating voltage	1 to 30 kV (0.1 kV steps)
Probe current range	10^{-12} to 5 × 10^{-7} A
Beam current stability	± 0.3 %/h
SE resolution	3 nm (WD 11 mm, 30 kV)
Minimum probe size	40 nm (10 kV, 1×10^{-8} A) 100 nm (10 kV, 1×10^{-7} A)
Scanning magnification	40 to 300,000× (WD 11 mm)
Scanning image resolution	Maximum 5120 × 3840
Color display	For EPMA analysis : LCD 1280 × 1024 For SEM operation and EDS analysis : LCD 1280 × 1024

* With optional analyzing crystal for Be analysis

Installation requirements

Power supply

Base unit	Single phase 200 V, 50/60 Hz, 4 kVA Allowable input-voltage fluctuation ± 10% (Ground : One, 100 Ω or less)
Computer	AC100 V, 50/60 Hz, 15 A or more

Cooling water

Faucet	One, JIS B 0203 Rc3/8 (R3/8 on hose end)
Flow rate	3.0 to 3.5 lit/min
Pressure	0.1 to 0.25 MPa (gauge)
Temperature	20 ± 5 ℃*
Drain	1 or more (Drain to accommodate 2 OD 10 mm hoses) *Water chiller (option) recommended

Dry N_2gas — To be purchased by user.

Pressure	0.4 to 0.5 MPa (gauge)
Gas outlet	JIS B 0203 (ISO7/1) Rc1/4 (female)

PR gas — To be purchased by user.

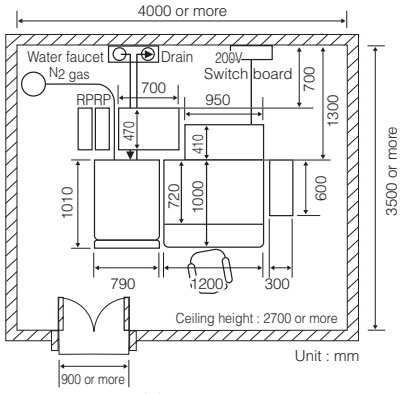
	Ar 90 %, CH_4 10 %
Gas outlet	JIS B 0203 (ISO7/1) Rc1/4 (female)

Installation room

Room temperature	20 ± 5 ℃ (fluctuation : ± 1 ℃ recommended)
Humidity	60 % or less (no condensation)
Stray magnetic field	0.1 μT(p-p) or less (50/60 Hz)*
	0.05 μT(p-p) or less, vibration of DC magnetic field*
Floor vibration	2 μm (p-p) or less (at 5Hz)*
Acoustic	70 dB (F) or less*
Floor space	4000 mm (W) × 3500 mm (D) × 2700 mm (H) minimum
Entrance	900 mm (W) ×1900 mm (H) minimum

* For conditions other than these, we will conduct a room survey prior to installation and determine the highest magnification attainable.

Installation Layout



Entrance : 1900 mm (H) minimum

*Specifications and appearance are subject to change without notice due to modification.

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