Solutions for Innovation

JSX-1000S

ElementEye

The Smart Solution for Elemental Analysis

JEOL Ltd.

Smarter solutions for more users

The JSX-1000S is an X-ray fluorescence spectrometer that provides easy, quick elemental analysis using touch panel operation.

High performance with simple operation

Based on many years of experience, JEOL has incorporated proprietary algorithms in the Fundamental Parameter (FP) method. This FP method delivers highly accurate qualitative and quantitative analysis results, without using a standard sample.
JEOL's own SDD (silicon drift detector) and newly-developed optical system, in combination with filters designed to handle the entire energy range, make it possible to achieve high-sensitivity analysis.
The sample chamber vaccum unit (option) further increases detection sensitivity for lighter elements.

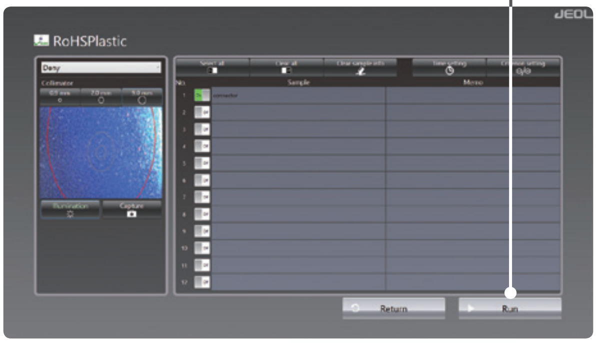
Simple Operation

Just Set the sample and Touch the screen.
Analysis values and pass/fail assessment results are updated in real-time, and the spectrum can be checked easily.

Set & Touch simple operation

1 *Set the sample*

2 *Touch the screen*

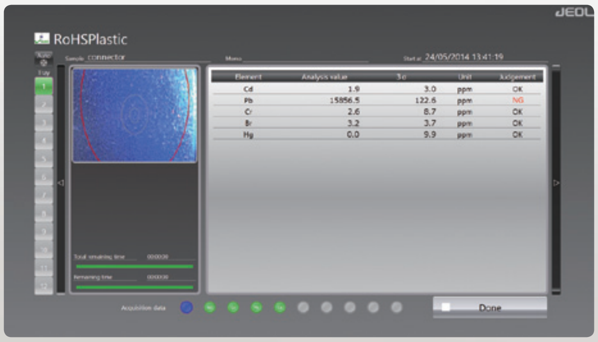


3 Analysis results displayed in real-time

Sample connector

Start at 24/05/2014 13:41:19

Tube voltage	50.00 kV
Tube current	1.000 mA
Collimator	9.00 mm
Filter	Pb
Atmosphere	AIR
Live time	10.00 sec
Remaining time	0.00 sec
Count rate	59473 cps



Sample connector

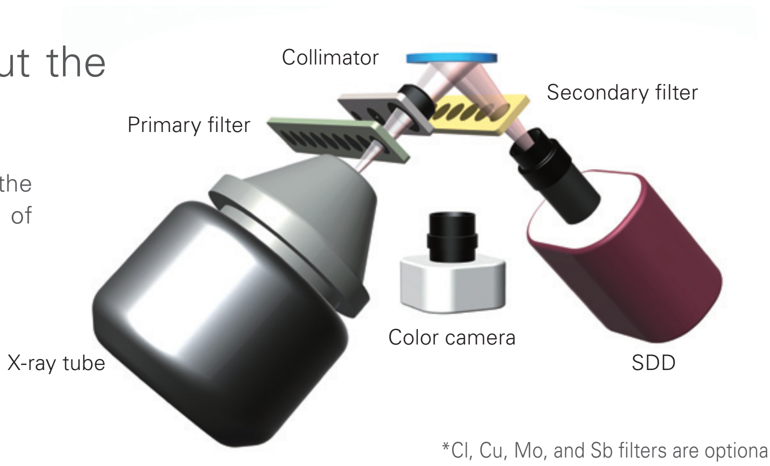
Start at 24/05/2014 13:41:19

Element	Analysis value	3σ	Unit	Judgement
Cd	1.9	3.0	ppm	OK
Pb	15856.5	122.6	ppm	NG
Cr	2.6	8.7	ppm	OK
Br	3.2	3.7	ppm	OK
Hg	0.0	9.9	ppm	OK

Swipe the screen to switch the display, and check the spectrum

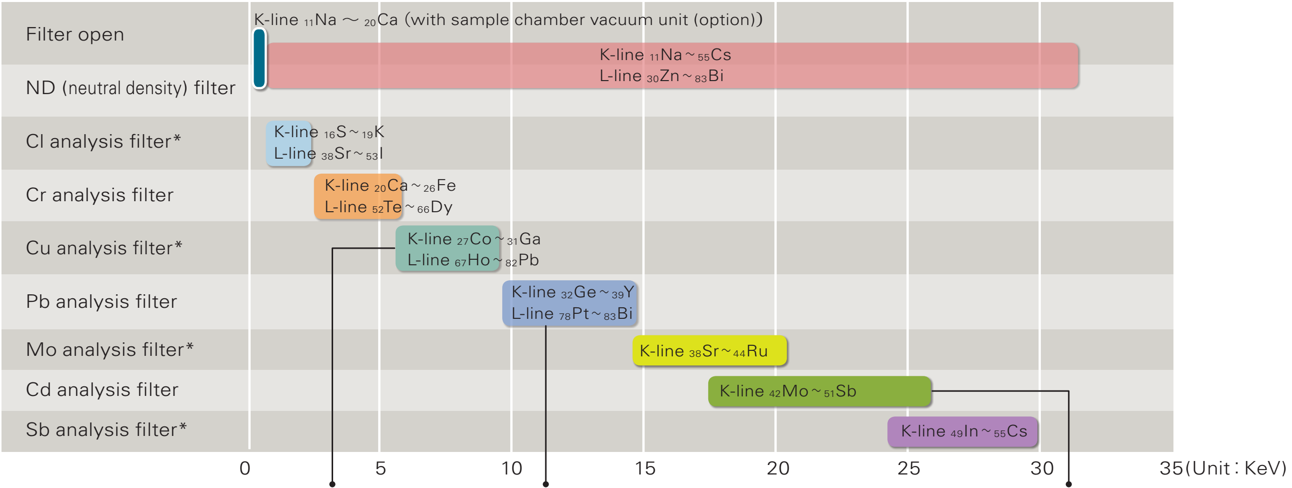
Sensitive analysis throughout the entire energy range

High-sensitivity analysis can be performed across the entire energy range using a maximum of 9 types of filters and a sample chamber vaccum unit.

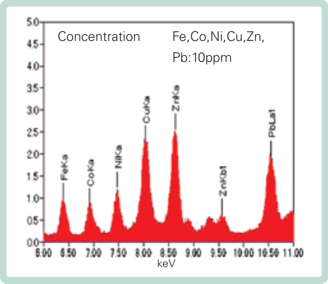


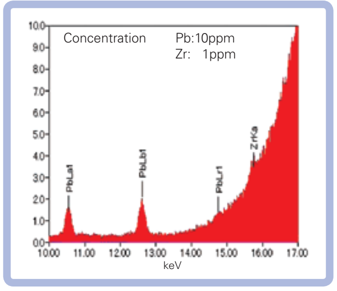
*Cl, Cu, Mo, and Sb filters are optional

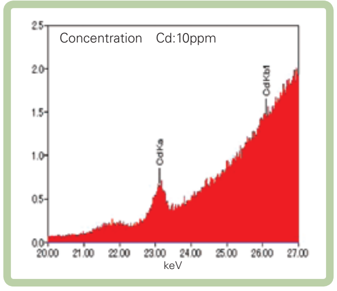
Table 1 Element correspondence with each filter and sample chamber vaccum unit.



Filter	Elements
Filter open	K-line $_{11}$Na ～ $_{20}$Ca (with sample chamber vacuum unit (option))
ND (neutral density) filter	K-line $_{11}$Na ~ $_{55}$Cs L-line $_{30}$Zn ~ $_{83}$Bi
Cl analysis filter*	K-line $_{16}$S ~ $_{19}$K L-line $_{38}$Sr ~ $_{53}$I
Cr analysis filter	K-line $_{20}$Ca ~ $_{26}$Fe L-line $_{52}$Te ~ $_{66}$Dy
Cu analysis filter*	K-line $_{27}$Co ~ $_{31}$Ga L-line $_{67}$Ho ~ $_{82}$Pb
Pb analysis filter	K-line $_{32}$Ge ~ $_{39}$Y L-line $_{78}$Pt ~ $_{83}$Bi
Mo analysis filter*	K-line $_{38}$Sr ~ $_{44}$Ru
Cd analysis filter	K-line $_{42}$Mo ~ $_{51}$Sb
Sb analysis filter*	K-line $_{49}$In ~ $_{55}$Cs



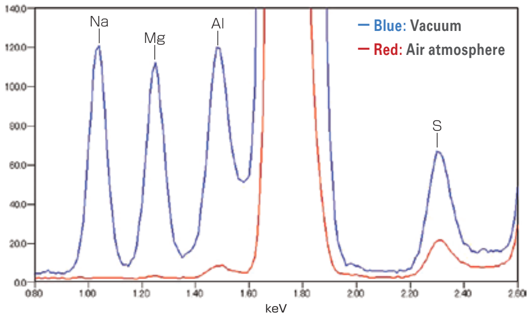




Options

・Sample chamber vaccum unit

Performing analysis in a vacuum makes it possible to improve sensitivity for lighter elements (Na ~ Al).



・Auto sample changer

A maximum of 12 samples can be exchanged automatically, allowing automatic continuous acquisition.

High-precision quantitative analysis

The new Smart FP (Fundamental Parameter) method makes it possible to obtain highly-accurate quantification results without the need to prepare a standard sample, and includes automatic correction for thickness and residual ingredient balance.
(The residual balance correction and thickness correction functions are only applicable to organic samples)

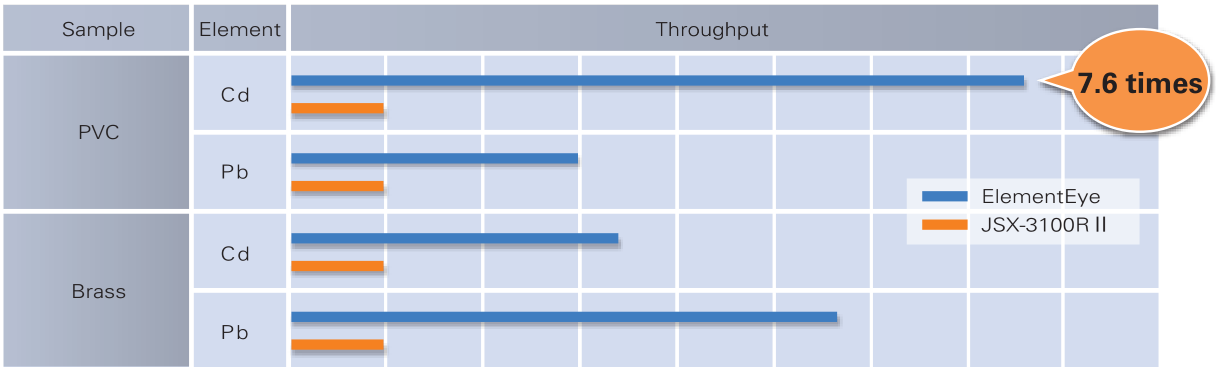
Table 2 Example : Polyethylene

Thickness	Correction	Cr	Zn	Cd	Pb	Automatic balance
0.5mm	No	0.008	0.037	0.001	0.002	99.76
3.8mm		0.012	0.109	0.004	0.006	99.64
0.5mm	Yes	0.011	0.137	0.015	0.010	99.54
3.8mm		0.011	0.134	0.016	0.011	99.55
Standard value		0.010	0.125	0.014	0.010	

High Throughput

The new high-sensitivity SDD (silicon drift detector) and short-path optical system achieve throughputs up to 7.6 times faster than the previous JEOL system (JSX-3100R Ⅱ)

Table 3 Comparison of Cd 10 ppm / Pb 50 ppm measurement times



Providing Solutions

With solution based applications, the desired analysis can be executed automatically according to pre-recorded recipes. Simply select the desired solution icon from the solution application list for automated analysis and display of results.

Solution applications offer simplified analysis for a wide range of industries

Standard Solution

- RoHs analysis (Metals)
- Simple analysis (Metals: Air / Vacuum*)
- Simple analysis (Oxides: Air / Vacuum*)
- RoHs analysis (Metals)
- Simple analysis (Organic materials: Air / Vacuum*)

(*option)

Optional Solution

- Ni plating screening
- Halogen screening
- Sn plating screening

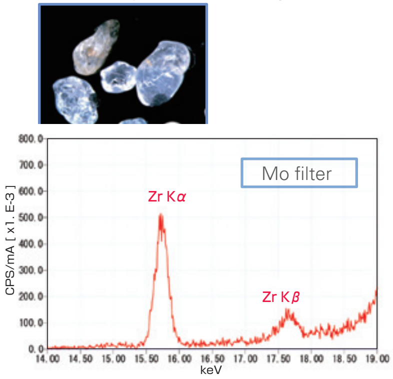
Smart Assist from ElementEye

With an X-ray fluorescence spectrometer you can perform elemental analysis with little or no sample preparation.
The easy operation of ElementEye assists your analysis work.

SEM-EDS

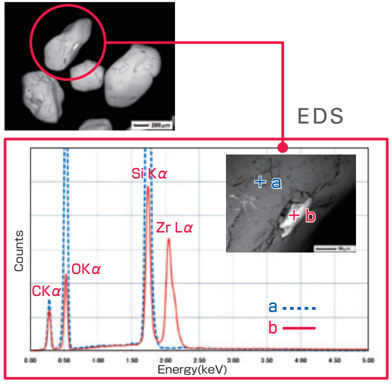
XRF solid sample analysis assist

XRF: Analysis of all sand particles



SEM: Backscattered electron image

EDS



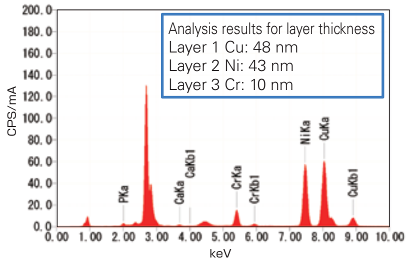
Zirconium (Zr) is found in sand from ocean and rivers; but not all sand contains Zr. Using XRF makes it possible to quickly determine whether there is any Zr in a sand sample. Using SEM-EDS allows you to identify which grains of sand contain Zr.
Combining XRF and SEM-EDS makes it easy to pinpoint the location of a target element.

XPS XRF thin-film analysis assist

Printed circuit board layers

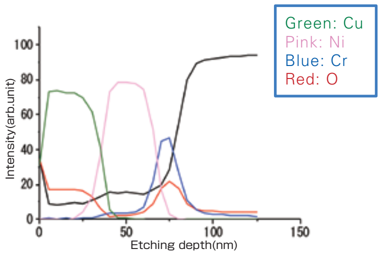
1	1, Cu
2	2, Ni
3	3, Cr
4	4, Polyimide

XRF



Analysis results for layer thickness
Layer 1 Cu: 48 nm
Layer 2 Ni: 43 nm
Layer 3 Cr: 10 nm

XPS

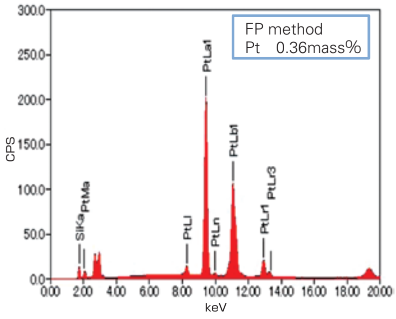


When acquiring a depth profile of a multi-layer sample using XPS, knowing the thickness of each layer in advance makes it possible to set the optimal etching conditions. With XRF it is easy to quickly determine the thickness of each layer. The depth profile data on the right was obtained by setting the etching conditions based on the layer thicknesses determined with XRF. With XPS, in addition to the film structure of the main components, it is also possible to identify non-uniform distributions of oxygen.

NMR

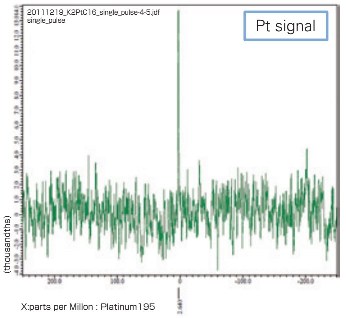
XRF fluid sample analysis assist

XRF



FP method
Pt 0.36mass%

NMR



NMR is widely used for the structural analysis of organic materials, measuring mainly hydrogen (^{1}H) and carbon (^{13}C). For measurements of nuclei other than ^{1}H and ^{13}C, the sensitivity varies depending on the concentration of the species. Therefore, obtaining composition information for the sample beforehand enables estimation of the appropriate acquisition conditions. Using XRF it is easy to determine the types and concentrations of elements, like Pt, contained in a sample.

Main Specifications & Options

Specifications

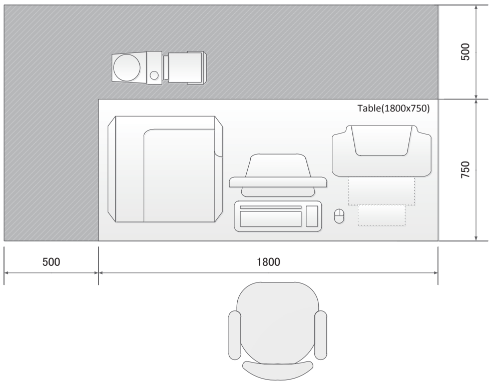
Detectable element range	Mg ~ U Na ~ U (option)
X-ray generator	5~50kV 1mA
Target	Rh
Filters: Maximum of 9 types, Automatic exchange	OPEN、ND ((neutral density filter)、Cr、Pb、Cd Cl、Cu、Mo、Sb (options)
Collimators: 3 types, Automatic exchange	0.9mm, 2mm, 9mm
Detector	Silicon drift detector
Sample chamber size	300mm$\phi \times$80mmH
Sample chamber atmosphere	Air atmosphere / Vacuum (option)
Sample chamber observation mechanism	Color camera
Computer for operation	Windows® desktop computer with touch panel
Analysis software	Qualitative analysis (Auto qualitative, KLM marker, Sum peak display, Spectrum search) Quantitative analysis (Bulk FP method, RoHS solution (Cd, Pb, Cr, Br, Hg) Simple analysis solution Report generation tool
Daily check software	Tube aging, Energy check, Intensity check

＊ Windows® is a registered trademark of Microsoft® Corp. in the U.S.A. and other countries

Main options

- Sample chamber vaccum unit
- Auto sample changer
- Filter set
- Filter FP method analysis software
- Thin-film FP method analysis software
- Sum peak removal software
- Ni plating screening solution
- Sn plating screening solution
- Halogen screening solution

JSX-1000S installation layout



Main unit size
600mm(W) x 560mm(D) x 430mm(H). 64kg

Installation requirements

Power supply	Single phase 100 to 120 V ±10%, 15 A, 50 / 60 Hz, Type D grounding
Environment	Temperature: 18 to 28°C Humidity: 30 to 70% (no condensation) Not subject to corrosive gas, dust, or discernible vibration Flows of heated or cooled air should not be directed at the system

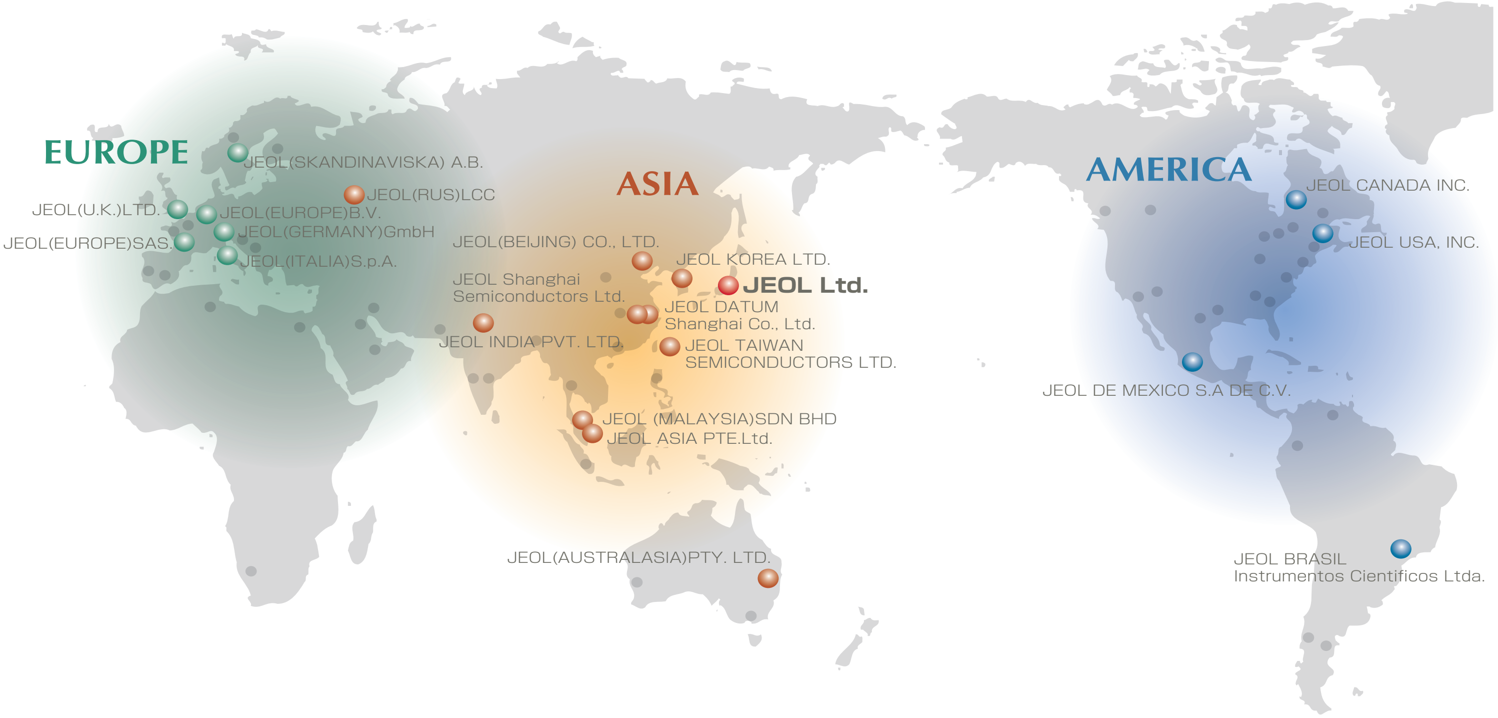
*Leave a maintenance space of at least 50 cm on all sides of the unit
*The external appearance and specification are subject to change without notice
*The customer must provide the work table and chair used for this instrument and PC.

*Legal documentations are required for instruments using X-rays, according to the regulations of countries where you are using them.

World Wide Service and Support

At JEOL, our goal is customer satisfaction. To meet customer requirements, JEOL has made great efforts to produce a high performance instrument with simple operation in the Element Eye.
JEOL has 20 subsidiary companies and a network of service support centers all over the world to maximize the up-time of your instrument.
Furthermore, our application engineers are available to provide you with technical information ranging from basic elemental analysis to technical solutions required for operation and maintenance, at local service centers around the world.
JEOL will continue to provide you with technical information, qualified repairs, consumable parts and attachments on a long-term basis.

World Wide Support Network



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High technology for quality assurance and the environment.

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*specifications subject change without notice.

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