

Scanning multi-element process coatings analyzer



- Silicone release coaters
- Converters
 - silicone on plastic or paper
- Vacuum formed plastics
 - denesting silicone coatings
- Specialty plastics
- RoHS compliance
- Conversion coatings
- Metalized plastic
- Top coatings on metal coil
- Fire retardants on fabric



Scanning multi-element process coatings analyzer

Featuring advanced third generation energy dispersive X-ray fluorescence (EDXRF) technology, the Rigaku NEX LS represents the next evolution of scanning multi-element process coatings analyzers for web or coil applications.

Proven technology and performance

To deliver superior analytical performance and reliability, the EDXRF measuring head assembly was derived from the established Rigaku NEX Series high-resolution benchtop instrumentation. With their proven technology, the Rigaku NEX LS delivers rapid, non-destructive, multi-element analyses — for coat weight, coating thickness and/or composition — for elements from aluminum ($_{13}\text{Al}$) through uranium ($_{92}\text{U}$).

																		Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr						
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe						
Cs	Ba		Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn						
Fr	Ra																						
		La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu							
		Ac	Th	Pa	U																		

Coating thickness and composition

Rigaku NEX LS is specifically designed to service web and coil applications, with the ability to perform multi-element composition, coat weight or coating thickness. The measuring head is mounted on a rigid beam and is equipped with a linear traversing mechanism positioned over a roller so that the head-to-surface distance is constant. Where needed, elemental composition of a coating is measured directly. In contrast, coat weight (or coating thickness) may be measured directly (where counting rate for an element is proportional to thickness) or indirectly by measuring attenuation of some substrate element (where counting rate is negatively correlated to thickness).



Silicone release coatings

Benchtop EDXRF spectrometers have long been a familiar technology for release coatings, converters, vacuum formed plastics manufacturers and other industries using silicone oils as barrier layers, release coatings or denesting agents. Real-time scanning, for tighter process control tolerances, takes EDXRF technology for silicone coatings analysis to the next level.



Silicone coatings are applied to plastic and paper substrates to modify the release characteristics of a product (like labels) or packaging. If too little silicone is applied or if there are areas of the web where the silicone coating is missing, the adhesive release properties will be adversely affected in release applications or the denesting characteristics of the vacuum formed plastic will be compromised causing product rejection or disruption in manufacturing and other downstream processes. If too much silicone is applied, the cost of the manufactured roll increases, reducing profitability and in some cases impacting acceptance and performance of the end product.

Scanning measurement system

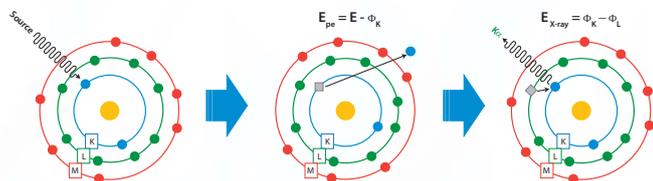
The Rigaku NEX LS is a scanning measurement system comprised of an EDXRF measurement head mounted to a motorized frame, which transports the head back and forth across a moving web (or coil) while transmitting the cross-machine direction (CD) measurements to a control box and industrial touch screen computer. Data are presented in real time as cross web and down web graphical profiles.

Broad range of applications

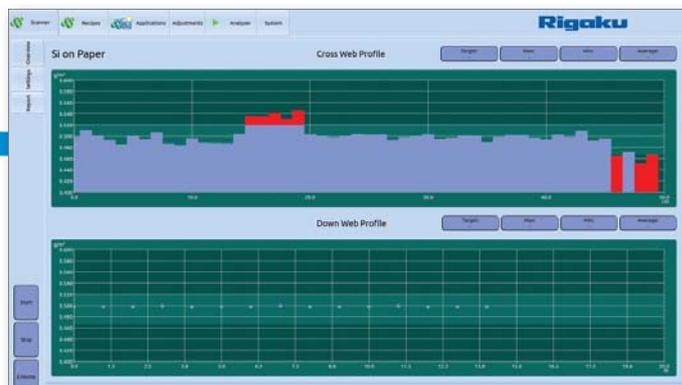
Equipped with a 50 kV X-ray tube and Fast® SDD detector — together with a standardized, optimized suite of tube filters — the Rigaku NEX LS is engineered to solve a broad range of process control coating applications.

XRF technique

With X-ray fluorescence (XRF), an electron can be ejected from an inner atomic orbital by the absorption of light (photon) from a X-ray tube. If ejected, an electron from a higher energy orbital transfers to fill the vacant orbital. During this transition, a photon may be emitted.



Because the energy difference between two specific orbital shells is always the same for a specific element, the emitted photon will always have a unique characteristic energy (keV). At any characteristic energy, the number of photons per unit time (counts per second) detected is correlated to the thickness or coat weight of that element in a coating.

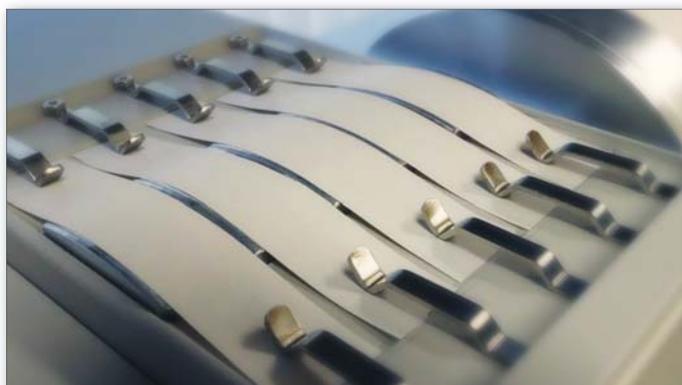


Software showing cross web (top) and down web (bottom) profiles

Advanced and flexible software

To maintain consistent quality, improve efficiency and minimize cost, the new NEX LS is designed specifically for the challenging conditions found in coating processes.

The 5-position automatic calibration station adds to the overall ease-of-use. In addition to real-time cross/down web profiles, user defined recipes inclusive of scan speeds and sub-second measurement settings, advance roll reporting and raw data logging are included for traceability and audits. Complete roll recording includes measurement value, date, time, length, product name, etc. In addition, web scan average and individual zone measurements are included.



NEX LS features and benefits

- Real-time process coating control by EDXRF
- Measure elements aluminum ($_{13}\text{Al}$) to uranium ($_{92}\text{U}$)
- Robust Rigaku NEX Series optical kernel
- Industrial touchscreen user interface
- Easy automatic calibration and routine operation
- Minimal routine maintenance
- No radioisotopes

NEX LS
LINEAR SCANNER

Coatings analysis by X-ray fluorescence

Specifications

Elemental coverage:

- Aluminum (Al) to uranium (U)
- Single or multi-element analysis
- Full scanning or user defined positions

Excitation:

- 50 kV X-ray tube
 - Limited to 5 kV for specific applications
- 4 W max power
- Up to 6 tube filter positions

Detection:

- Fast® SDD (silicon drift detector)
- High resolution and throughput
- Thermoelectrically cooled

User interface:

- Industrial 19.5" widescreen touchscreen display

Software features:

- Linux software platform
- Sub-second analysis settings
- Manual or auto calibration
- User defined recipes
- Cross web and down web roll reports

Linear scanner:

- Custom lengths
- Edge sensor
- Home station with 5-position calibration plate
- Emergency stop
- LED tower light for system status

Communications:

- MODBUS over Ethernet

Outputs:

- Results reporting - three 4 – 20 mA
- General alarm - dry contact relay
- General warning - dry contact relay
- Process alarm (out of bounds) - dry contact
- Scanning state - dry contact relay
- Measuring state - dry contact relay

Inputs:

- Line speed - 4 – 20 mA
- Select Recipe - 4 – 20 mA
- Scan – dry contact relay
- Measure – dry contact relay
- Standardize – dry contact relay
- Tare – dry contact relay
- Collect Sample – dry contact relay
- Emergency Stop – dry contact relay

Area classifications:

- Non-classified

Ambient conditions:

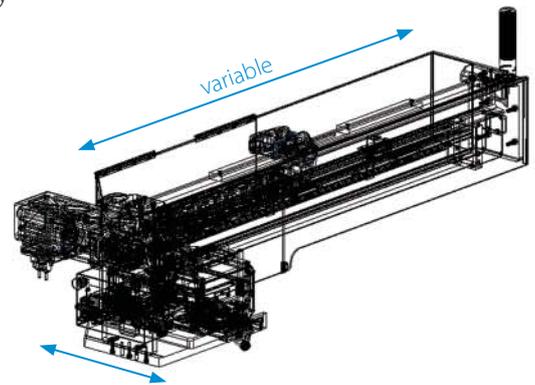
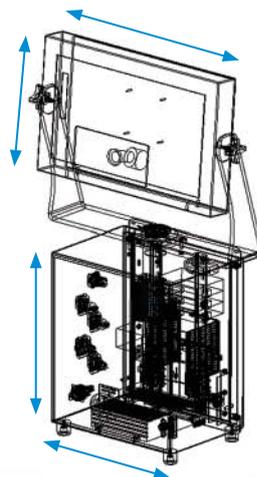
- 0 – 35°C (32 – 95°F)
 - Consult Rigaku for other temperature ranges

Power requirements:

- 110/240 V, 10 A max (50 – 60 Hz)
 - Dedicated supply

Options:

- Helium purge
- Vortex cooler
- Linear scanner cover



Backed by Rigaku

Since its inception in 1951, Rigaku has been at the forefront of analytical and industrial instrumentation technology. Today, with hundreds of major innovations to our credit, the Rigaku Group of Companies are world leaders in the field of analytical X-ray instrumentation. Rigaku employs over 1,400 people worldwide in operations based in Japan, the U.S., Europe, South America and China.



Rigaku

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