NEX CG II SERIES

Enhanced Elemental Analysis by X-ray Fluorescence

Next-generation Cartesian Geometry EDXRF Analyzers

Rigaku

Applied Rigaku Technologies

NEX CG II SERIES

Enhanced Elemental Analysis for Industrial Quality Control to Advanced Research Applications




Next-generation NEX CG II Series analyzers are multi-element, multi-purpose benchtop energy dispersive X-ray fluorescence (EDXRF) spectrometers that perform rapid qualitative and quantitative trace elemental analyses. They provide non-destructive analysis of sodium (Na) through uranium (U) in almost any matrix. NEX CG II Series instruments offer users fast, reliable measuring and monitoring for ultra-low and trace element concentrations up to high weight percent levels.

These systems are especially well-suited for trace element analysis for environmental monitoring, industrial waste applications, recycled materials, electronic components, agriculture, mining, cement, and cosmetics, and address the needs of many other applications. They serve many industries, from industrial and in-plant quality assurance to research and development.

In addition, users can obtain high-throughput measurements with various autosampler options, accommodating 32-, 40-, and 52-mm samples. NEX CG II Series spectrometers do not require cooling water or liquid nitrogen, and their enclosures measure 463 mm (W) × 492 mm (D) × 382 mm (H). This small footprint makes them an attractive instrument for any commercial lab or R&D facility. Available models are NEX CG II for excellent spectral resolution for trace peaks or NEX CG II+ for more demanding applications, which require a high-powered system for improved sensitivity.

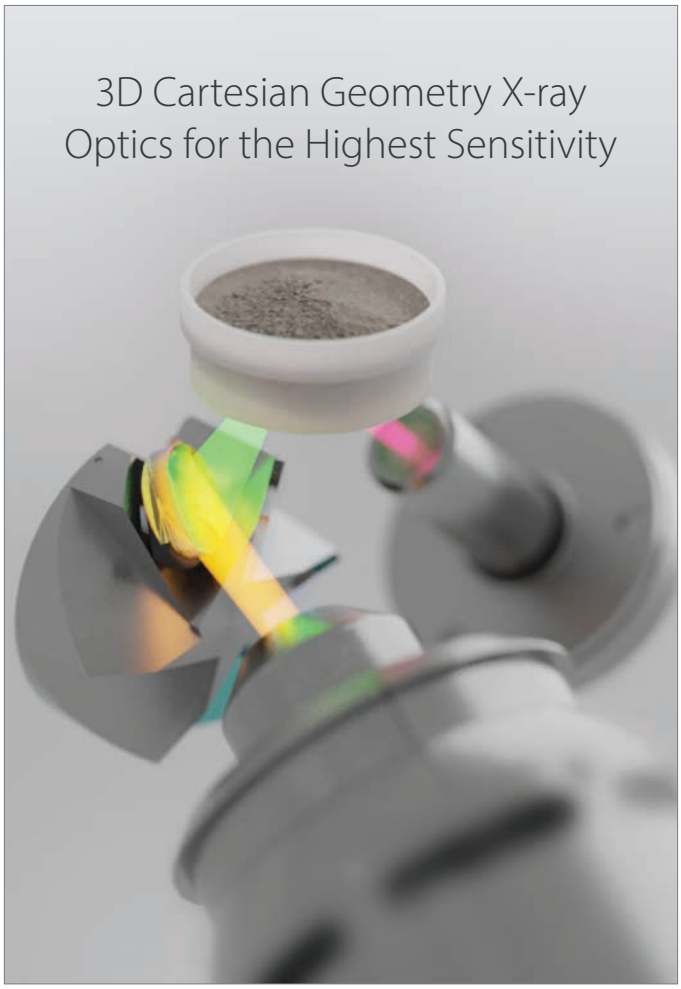
Close-coupled Cartesian Geometry Optical Kernel for the Highest Level of Analytical Sensitivity

What makes NEX CG II Series spectrometers unique?

NEX CG II Series spectrometers build on the first-generation NEX CG's legacy of using Cartesian Geometry and secondary targets for trace-level sensitivity. They feature a unique three-dimensional (3D) close-coupled Cartesian Geometry optical kernel that dramatically increases the peak-to-background ratio. This results in spectrometers capable of trace element analysis — even in challenging sample types.

Unlike conventional EDXRF, NEX CG II Series spectrometers are indirect excitation systems using secondary targets rather than tube filters. Monochromatic and polarized excitation from secondary targets vastly improves detection limits for elements in highly scattering matrices like water, hydrocarbons, and biological materials. Secondary target excitation in full 90° Cartesian Geometry eliminates background noise. As a result, the NEX CG II Series analyzers bring a new level of analytical sensitivity to XRF technology.

The optics of the NEX CG II Series are shown in the figure on the right. The 3D arrangement between the X-ray tube, secondary target, measurement sample, and detector reduces and virtually eliminates the Bremsstrahlung background that could interfere with analysis, allowing more elemental signal in the detector for excellent detection of trace peaks in many matrices.



When the X-ray tube, secondary target, sample, and detector are aligned in 90° Cartesian Geometry, measurements have no background.

Key Advantages & Features

- Non-destructive elemental analysis for sodium (Na) to uranium (U)
- Rapid elemental analyses of solids, liquids, powders, coatings, and thin films
- Indirect excitation for exceptionally low detection limits
- High-power X-ray tubes (50 kV, 50 W or 65 kV, 100 W)
- Large-area high-throughput silicon drift detector (SDD)
- Analysis in air, helium, or vacuum
- Powerful and easy-to-use QuantEZ® software with multilingual user interface
- Advanced RPF-SQX Fundamental Parameters software featuring Scattering FP
- Rigaku Profile Fitting (RPF) advanced algorithm for peak deconvolution
- Various automatic sample changers accommodating up to 52 mm samples
- Low cost of ownership backed by a 2-year warranty

Pushing the Boundaries of EDXRF

The Rigaku NEX CG II pushes the boundaries of EDXRF. It achieves superior analytical power with a 50 kV 50 W end-window palladium-anode X-ray tube, five secondary targets covering the complete elemental range sodium through uranium (Na – U), and a large-area high-throughput silicon drift detector (SDD).

Users can achieve exceptionally low limits of detection and easily manage complex applications like testing agricultural soils and plant materials, analyzing finished animal feeds, measuring waste oils, environmental monitoring, and many others.

NEX CG II Features a
50 kV, 50 W X-ray Tube

Multi-element, Multi-purpose EDXRF Analyzers

NEX CG II Series analyzers serve many screening and monitoring needs. Applications range from industrial and in-plant quality control processes to use in commercial labs and research facilities and help support compliance with various testing methods and standards. They are powerful enough for experts and easy to use for those running routine quality control.

- ✓ Agri-food
- ✓ Catalysts
- ✓ Cement
- ✓ Coatings
- ✓ Cosmetics
- ✓ Education
- ✓ Environmental
- ✓ Geology
- ✓ Metals and Alloys
- ✓ Mining and Refining
- ✓ Paint and Pigments
- ✓ Petroleum and Fuels
- ✓ Pharmaceuticals
- ✓ Plastics and Polymers
- ✓ Recycling and Sustainability
- ✓ RoHS/WEEE
- ✓ Wovens and Non-wovens

Rigaku's Most Powerful EDXRF

NEX CG II+ is Rigaku's most powerful indirect excitation EDXRF system yet. It is a high-end spectrometer well-suited for trace element analysis for pharmaceutical materials, catalysts, cosmetics, monitoring for toxic metals in aerosols on air filters, as well as analyzing trace heavy metals and rare earth elements (REE), and other applications requiring a high degree of sensitivity.

NEX CG II+ reinvents XRF with a high-power 65 kV, 100 W X-ray tube, five secondary targets covering the complete elemental range sodium through uranium, and a large-area, high-throughput silicon drift detector (SDD). Its 3D configuration, high voltage, and power eliminate background noise and deliver high count rates, allowing for more signal in the detector. This powerful, unprecedented combination results in the lowest detection limits and excellent spectral resolution for trace peaks.

NEX CG II+ Features a 65 kV, 100 W X-ray Tube

✓ Analyze Sodium (Na) to Uranium (U)

Exceptional versatility. Measure most elements from parts-per-million (ppm) levels to wt% in solids, liquids, powders, coatings, and thin films.

✓ Indirect Excitation for Exceptionally Low Detection Limits

Unique three-dimensional (3D) close-coupled Cartesian Geometry (CG) optical kernel employs monochromatic and polarized excitation from secondary targets to remove background, resulting in exceptionally low detection limits.

✓ Large-area High-throughput SDD

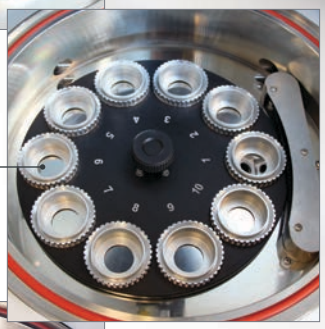
The silicon drift detector (SDD) delivers superior peak shape and resolution while supplying high-count rates for the lowest possible detection limits.

✓ High-power X-ray Tube

The close-coupled end-window palladium-anode X-ray tube is shuttered for maximum flux stability. Available with a 50 kV, 50 W (NEX CG II) or 65 kV, 100 W (NEX CG II+) X-ray tube.

✓ Automated Sample Handling

Obtain high-throughput measurements with various autosampler options, accommodating 32, 40, and 52 mm samples.



✓ Analyze Non-uniform Samples

The optional 10-position 40 mm automatic sample changer with spinner achieves superior results for inhomogeneous samples.

✓ Measure Large Samples

The large sample chamber accommodates samples up to 32.5 cm in diameter and 7.5 cm tall for direct analysis.

✓ PPB-level Aqueous Analysis

Quantify trace elements in aqueous samples down to parts-per-billion (ppb) concentration levels with Ultra Carry® sample carrier.

✓ Detector Protection

The aperture window and the 15-position 32 mm and 10-position 40 mm sample trays are specially designed to protect the detector from spills and leaks.

✓ Analysis Under Vacuum, Helium, or Air

Control atmospheric parameters with measurements made in air, helium for enhanced light element sensitivity, or under vacuum, delivering superior light element sensitivity for non-volatile samples. The optional vacuum system comes with a high-capacity pump and vacuum sensor, and the helium purging unit is specially designed to reduce helium consumption.

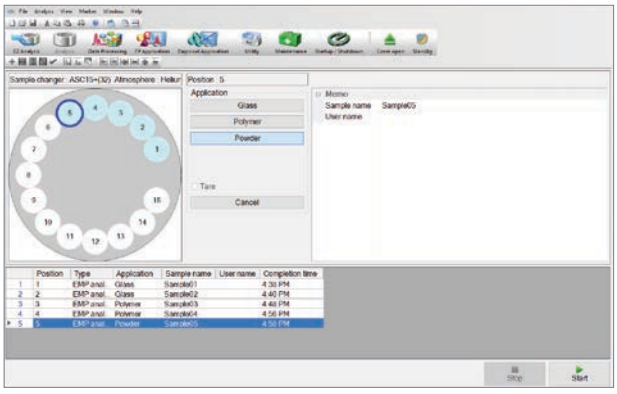
Analyze With All the Features You Need

✓ Advanced Fundamental Parameters Software

RPF-SQX, featuring Rigaku Profile Fitting technology and Scattering FP, allows semi-quantitative analysis of almost all sample types without standards — and rigorous quantitative analysis with standards.

✓ QuantEZ® for Simple Routine Operation

NEX CG II Series analyzers are easy to use with QuantEZ, a powerful PC-based software providing intuitive instrument control with simple menu navigation and a customizable EZ Analysis interface. Users can maximize their time and productivity with simplified routine operations and create their own methods using a simple flow bar wizard. Users select the sample position on the computer screen and enter a sample name. Next, select the application method (i.e., calibration) and click the "Start" button to initiate the analysis.



Legacy of Innovation

The design and development of NEX CG II Series spectrometers are backed by years of Rigaku innovation and EDXRF experience. The NEX CG is historically significant in that it was the first Rigaku EDXRF spectrometer featuring full 90° Cartesian Geometry and indirect excitation offered by Applied Rigaku Technologies. When introduced to the market, the versatility, flexibility, and sensitivity gave and continues to provide many users superior analytical power to solve their analytical needs. With a commitment to build better products driven by customer feedback, NEX CG II Series systems bring a new level of analytical sensitivity and usability to XRF technology.

NEX CG II Series analyzers are easy to use for non-technical operators yet powerful enough for expert use in commercial labs and R&D facilities. The new superior analytical power of NEX CG II Series push the boundaries of EDXRF with their unique and improved close-coupled Cartesian Geometry (CG) optical kernel, smaller footprint, and various new hardware upgrades. With the addition of high-power X-ray tube options, a high-performance large-area silicon drift detector, and Rigaku's advanced RPF-SQX Fundamental Parameters software, NEX CG II Series spectrometers deliver the most sensitive EDXRF measurements in the industry.

First-generation NEX CG

Second-generation NEX CG II Series

Next-generation Spectrometers That Bring A New Level of Analytical Capabilities to XRF Technology

NEX CG II Series are inexpensive compared to other technologies, and they offer the flexibility and reliability users need to monitor critical elements for a wide range of applications. With unique Cartesian Geometry optical kernels, they deliver better analytical sensitivity, allowing users to measure and monitor almost any matrix and obtain reliable results.

With multi-element, multi-application analysis capabilities, the NEX CG II Series analyzers offer users plenty of flexibility and versatility. Capable of standardless semi-quantitative analysis, these systems also dramatically reduce the number of standards needed to implement a high-quality calibration. When standards are difficult to obtain or for complex matrices where many elements vary independently, this is especially useful.

NEX CG II Series analyzers excel in complex applications with trace elements and variable-base matrices. Users can obtain high-throughput measurements with various autosampler options, and with the Ultra Carry® sample carrier, users can quantify trace elements in aqueous samples down to parts-per-billion (ppb) concentration levels. With these capabilities, NEX CG II Series spectrometers rival large, more expensive systems and replace the need for multiple single-element benchtops. This unmatched performance and smaller footprint make them an attractive instrument for any commercial lab or R&D facility.

Powerful and Easy-to-use Software

The capabilities and features of Rigaku software are the results of decades of XRF software development at Rigaku. Rigaku software is developed to be both extraordinarily powerful and extremely easy to use.

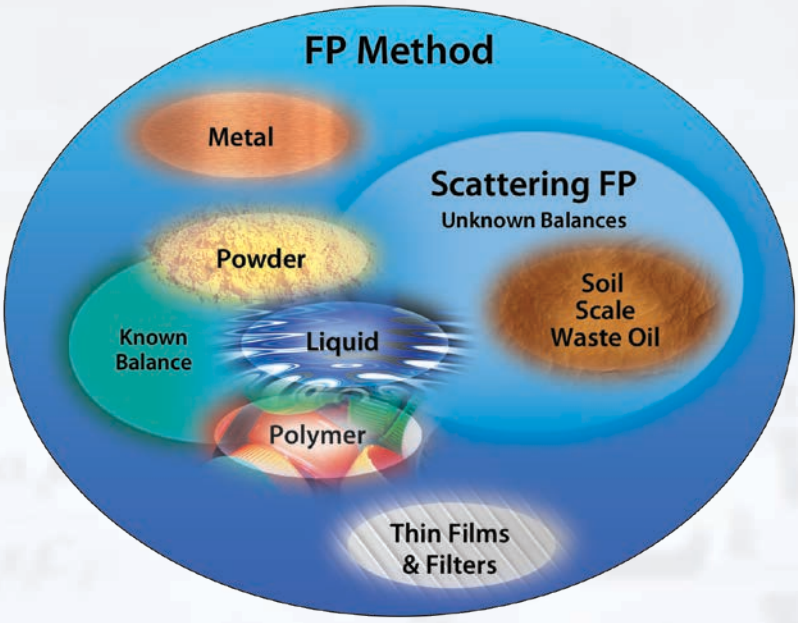
Using user-friendly software, setting measurement conditions and analysis operations is intuitive and available in multiple languages. QuantEZ, a powerful PC-based software provides intuitive instrument control with simple menu navigation and a customizable EZ Analysis interface. Users can maximize their time and productivity with simplified routine operations and create their own methods using a simple flow bar wizard.

Various software options are available to meet user needs, including SureDI, supporting compliance with 21 CFR Part 11.

Advanced Fundamental Parameters

Advanced qualitative and quantitative analysis is powered by Rigaku's RPF-SQX Fundamental Parameters (FP) software, featuring Rigaku Profile Fitting (RPF) technology and Scattering FP. This robust integrated software allows semi-quantitative analysis of almost all sample types without standards — and rigorous quantitative analysis with standards. Rigaku's Scattering FP method automatically estimates the concentration of unmeasurable low atomic number elements (hydrogen to fluorine) and provides appropriate corrections.

Calibration standards can be expensive and difficult to obtain for many applications. With RPF-SQX, the number of required standards is greatly reduced, significantly lowering the cost of ownership and reducing workload requirements for running routine analyses.



Years of EDXRF Experience



Applied Rigaku Technologies, a division of Rigaku Corporation, engineers, manufactures, and distributes Rigaku EDXRF products worldwide. Located in Cedar Park, Texas, USA, our company specializes in benchtop and on-line spectrometers for the non-destructive elemental analysis of solids, liquids, powders, coatings, and thin films.

Many industries and organizations use Rigaku EDXRF instruments to solve their analytical needs. Applications range from research & development to industrial and in-plant quality assurance, agriculture, mining, and more. Applied Rigaku Technologies provides users with advanced, high-quality EDXRF analyzers and offers customer-focused solutions and support backed by Rigaku innovation and years of EDXRF experience.

Applied Rigaku Technologies offers a 2-year warranty on all EDXRF spectrometers it produces. This industry-leading manufacturer's warranty shows a commitment to quality and dedication to maximizing uptime for its customer's processes and applications. Applied Rigaku Technologies' robust designs use quality materials, and employees take pride in their craft. If a warranty-related deficiency happens, they are quick to respond. Common warranty plans often do not extend past a year, making this coverage a testament to the overall excellence of Rigaku EDXRF products and services.

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 their credit, the Rigaku group of companies are world leaders in the fields of general X-ray diffraction, thin film analysis, X-ray fluorescence spectrometry, small angle X-ray scattering, protein and small molecule X-ray crystallography, Raman spectroscopy, X-ray optics, semiconductor metrology, X-ray sources, computed tomography, non-destructive testing, and thermal analysis.

Rigaku employs over 1,500 people worldwide in operations based in Japan, the U.S., Europe, and China. We value our customers, value our people, and value our technology. Close collaboration between our users and employees sets the direction and focus of our work, allowing us to address customers' needs and stay close to the marketplace.

Specifications

General

Indirect excitation energy dispersive X-ray fluorescence (EDXRF)
Analytical range Na to U
PPM to % levels

Excitation

X-ray tube, end-window type with Pd anode
50 kV max voltage, 50 W max power (NEX CG II)
65 kV max voltage, 100 W max power (NEX CG II+)
Five standard polarization and secondary targets for optimum excitation

Detection

Large-area high-throughput silicon drift detector (SDD)
Peltier electronic cooling
Digital pulse processor
Automated or user configurable shaping times for optimum analytical performance

Sample chamber

Large 32.5 cm diameter x 7.5 cm deep sample chamber allows for various sample sizes

Environmental conditions

Ambient temperature 18 – 28°C (65 – 82°F)
Relative humidity ≤75%
Vibration undetectable by human
Free from corrosive gas, dust and particles
Pollution degree 2

Software

QuantEZ® software for control of spectrometer functions and data analysis
Simple flow bar wizard to create your own methods
Empirical calibration with overlap and matrix compensation
Data export to USB or Ethernet
Multi-language (English, Chinese, French, Japanese, Portuguese, Italian, Spanish, German, and Russian)

Warranty

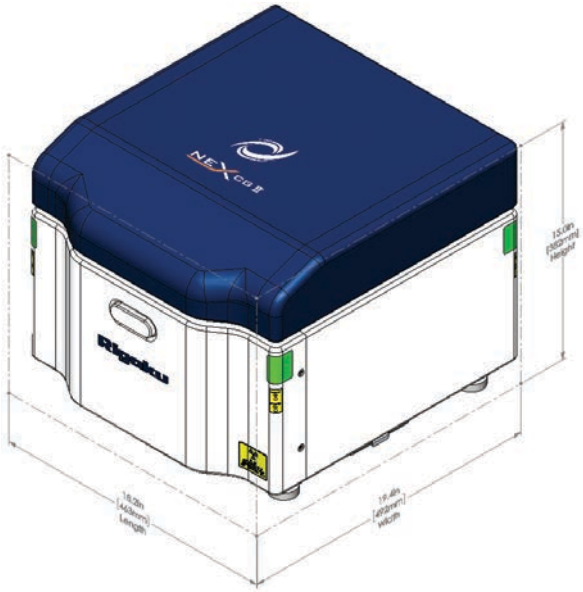
Our Guarantee
Applied Rigaku Technologies offers a 2-year warranty on all EDXRF spectrometers it produces. This industry-leading manufacturer's warranty shows our commitment to quality and displays our dedication to maximizing uptime for our customer's processes and applications.

Options

15-position automatic sample changer (32 mm samples)	
10-position automatic sample changer (40 mm samples)	
10-position automatic sample changer with sample spinner (40 mm samples)	
9-position automatic sample changer (52 mm samples)	
Helium purge	
Vacuum system	
RPF-SQX Fundamental Parameters software	Qualitative and quantitative analysis Matching Library for augmentation of FP Automatic spectral overlap deconvolution
Material ID software	
IQ/OQ instrument validation	
SureDI support for 21 CFR Part 11 compliance	
LIMS	
Ultra Carry® for trace analysis of aqueous solutions	
Uninterruptible power supply (UPS)	
Computer	External PC, desktop or notebook Microsoft® Windows® operating system Keyboard, mouse, and LCD monitor (desktop)

Spectrometer data

Single phase AC	100 – 240 V, 3.8 – 1.6 A (50/60 Hz) or 100 – 240 V, 5.2 – 2.6 A (50/60 Hz)
Overvoltage category II	
Two slow blow fuses	250 V/6.3 A, 5 x 20 mm (NEX CG II) 250 V/10 A, 250 V/6.3 A, 5 x 20 mm (NEX CG II+)
Dimensions	46.3 (W) x 49.2 (D) x 38.2 (H) cm (18.2 x 19.4 x 15.0 in)
Weight	Approximately 65 kg (143 lbs) (NEX CG II) 68 kg (149 lbs) (NEX CG II+)



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