



For chemical and phase analysis of solids, liquids and powders

Metals, cement, mining, petrochemicals, environment, electronics,
geology, glass, polymers, forensics, materials science, raw materials

Basic X-ray fluorescence analysis

When space and resources are limited or you are trying X-ray analysis for the first time, Thermo Scientific energy-dispersive and compact wavelength-dispersive X-ray fluorescence models offer the easiest route into the exciting world of rapid non-destructive elemental analysis.

Portable EDXRF systems

Thermo Scientific™ Niton™ portable XRF analyzers – get lab-quality results in the field

- Large portfolio of handheld analyzers including the newest, Thermo Scientific™ Niton™ XL5, as well as the existing Thermo Scientific™ Niton XL3t and Niton XL2 Plus series of analyzers
- Rapid, precise metal alloy identification, and verification
- Ideally suited for applications in various industries including positive material identification in energy, petrochemical and power generation; fabrication and QA/QC; and scrap metal recycling
- Verification of gold and other precious metals
- On-site elemental assay of soil, rock, ore for mining and exploration
- Positively identify hazardous materials in consumer products, electronics, environmental samples and toxic metals to ensure regulatory compliance
- Purpose built for the most rugged environment, analyzers are easy to use and offer superior detection limits and exceptionally fast measurement times to ensure confident decision making



Benchtop EDXRF spectrometer

Thermo Scientific™ ARL™ QUANT'X – flexibility for the laboratory

- Analyze F to Am in samples of any shape, type or composition
- A cost-effective all-round and stand-alone XRF solution
- Popular with laboratories responsible for research, forensics, environmental analysis, regulatory compliance and quality control
- Large sample chamber for multi-point sample analysis and automated multi-sample handling in air, vacuum and helium
- Sample imaging and adjustable beam size bridge the gap between bulk and micro XRF without compromises
- Advanced solid-state detector technology means easy installation, no special site requirements and low cost of ownership
- Unrivalled precision in standard-less analysis of any sample with the exclusive Thermo Scientific UniQuant Analysis Software



Sequential/simultaneous WDXRF spectrometer

Thermo Scientific™ ARL™ OPTIM'X – smart, optimized WDXRF

- Analyze O to Am in prepared solid, fused bead, powder or liquid samples
- Wavelength dispersion offers high resolution and selectivity for consistent and reliable performance, regardless of matrix
- Best sensitivity in its class for F to Fe enables precise analysis of cement, slag, ceramics, feldspar, glass, ores and minerals
- Ideal for routine applications in process control and general laboratories with moderate sample throughput
- Low power consumption, integrated vacuum pump, minimal site requirements
- Excellent compact inorganic material analyzer which reduces expenses, turn-around time and complements existing ICP capability



Advanced X-ray fluorescence analysis

For critical process control and laboratory applications, we offer high-power Thermo Scientific wavelength dispersive X-ray fluorescence and X-ray diffraction instruments that are unmatched in speed, precision and reliability. You can even combine both XRF and XRD in the same instrument for truly comprehensive materials analysis from every angle.

Sequential WDXRF spectrometers

Thermo Scientific™ ARL™ PERFORM'X – where performance meets versatility

- Analyze Be to Am in solids, fused beads, powders or liquids
- Wide dynamic range allows for concentration analysis from sub ppm to 100%
- 6th generation goniometer, fully digitally mastered, working at highest speed with best accuracy and precision
- Choice of generator power (1500W, 2500W or 4200W) depending on the analysis speed required
- Small spot capability down to 0.5 mm bridges gap between bulk and micro investigation and allows analysis of small defects
- Advanced sample mapping feature for complete elemental visualization and quantification of non-homogenous surfaces, inclusion and contamination research with 0.1 mm steps
- Scan based QuantAS semi-quantitative analysis for simple, push-button identification of any unknown sample
- Unrivalled precision in standard-less analysis of any sample with the exclusive UniQuant analysis software

Special version for routine application for slags and in the cement industry

- Analyze F to Fe in pressed pellets or fused beads
- 6th generation goniometer, fully digitally mastered, working at highest speed with best accuracy and precision
- Field upgradable to a fully-featured high power instrument



Simultaneous WDXRF and integrated XRD system

Thermo Scientific™ ARL™ 9900 – complete X-ray analysis

- Analyze B to Am in solids, fused beads or pressed powders
- Configurable for your applications with choice of goniometers, monochromators and compact XRD integrated system
- Unbeatable speed, precision and light-element sensitivity with up to 32 dedicated fixed channels monochromators including one detector for each element
- Obtain elemental and phase information in one report from the exclusive integrated XRF-XRD design
- Choice of generator power depending on the analysis speed required: 1500 W, 2500 W and 4200 W
- Safe and reliable loading of samples with X-ray tube above the sample
- Scan based QuantAS semi-quantitative analysis for simple, push-button identification of any unknown sample
- Unrivalled precision in standard-less analysis of any sample with the exclusive UniQuant analysis software
- The only solution for critical process control applications when every second counts in metallurgy, mining and cement industries
- More than one thousand ARL 9900 spectrometers are installed worldwide and two hundred of them are integrated into full laboratory automation systems



Powder X-ray diffraction

Thermo Scientific™ ARL™ EQUINOX 100 – Transportable benchtop X-ray Diffractometer

- Compact benchtop with micro source X-ray technology coupled with Smart Optics™
- Lightweight (~85 kg) easy to install, and basic maintenance free operation
- < 200W total power consumption
- Easy to use for everyone and no alignment needed
- Standard power supply and no external water cooling
- Large choice of X-ray anode (Cu, Co or Mo)
- Real time acquisition over $110^\circ 2\theta$
- Ideal for QC/QA, phase identification and quantification
- Measurements on powder, bulk and thin film - Ambient or high temperature



Thermo Scientific™ ARL™ EQUINOX 1000 – The only true high-power benchtop XRD

- Excellent instrument for resolute data in a reduced space
- Full power (3kW) benchtop using standard sealed X-ray tube
- Choice of X-ray anode (Cu or Co)
- Easy to use for everyone and no alignment needed
- Basic maintenance free operation
- Brilliant beam with Germanium (111) monochromator for highest resolution
- Real time acquisition over $110^\circ 2\theta$
- Ideal for QC/QA, phase identification and quantification
- Measurements on powder, bulk and thin film - Ambient or high temperature



Thermo Scientific™ ARL™ EQUINOX 3000/3500 – Ideal for XRD research and development

- State-of-the-art powder XRD
- Easy to use, no major alignment needed and basic maintenance free operation
- Real time acquisition over 120° or $90^\circ 2\theta$ (ARL EQUINOX 3000 or 3500)
- Excellent resolution (better results with ARL EQUINOX 3500)
- Very fast acquisition – Recommended for dynamic studies
- Thin layer (GIXRD, XRR) capabilities
- Compatible with research accessories: hot stage, cryo and humidity stage, etc.
- The most efficient solution to strengthen your research
- Ideal for research and development, phase identification and quantification, Rietveld analysis, QC/QA



Thermo Scientific™ ARL™ EQUINOX LAUE – Specially design for determination of crystal orientation by XRD

- Laue XRD measurements in back reflection
- Easy to use, no major alignment needed and basic maintenance free operation
- Full power (3kW) instrument with a Mo or W sealed X-ray tube
- 2D detection for fast collection of Laue patterns on single crystals
- Fast data acquisition with a high intensity white radiation
- Versatile sample support composed of a goniometer head
- Manually operated goniometer head, directly transferable to a wire saw
- Examples of studied crystals: Al_2O_3 , YAG, KTP, CdTe, Quartz, Tungsten, CaF_2 , LiF, etc.
- Ideal in both industrial and academic research laboratories as well as QC/QA or operations facilities



Thermo Scientific X-ray automation systems

Analysis automation improves sample throughput, repeatability and allows you to meet tighter product specifications and time pressure without increasing overhead costs. All automation solutions are customized to meet your specific requirements.



**Thermo Scientific
ARL OPTIM'X XRF with
Thermo Scientific™ SMS-Omega**



**Thermo Scientific
ARL PERFORM'X XRF with
Thermo Scientific™ SMS-PFX**



**Thermo Scientific
ARL 9900 XRF/XRD with
Thermo Scientific™ SMS-XY**

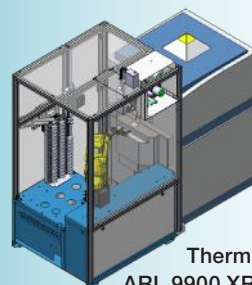
Simple automation for simultaneous and/or sequential XRF

- Circular Omega magazine or large XY magazine for sample handling
- Oxide and metals/oxide versions, fully unattended operation
- Control of sample preparation
- Built-in automated procedures for spectrometer performance verification and fine-tuning
- Easy introduction of manual samples via the instrument magazine

The Thermo Scientific™ ARL™ SMS-2300, SMS-2500 and SMS-3500 robotized systems

- Ultimate sample handling flexibility and speed with the automated Thermo Scientific ARL 9900 X-ray spectrometer with ARL SMS-2300 or SMS-2500 robotized system
- One robot, two instruments! The ARL SMS-3500 can automate both an XRF and an OES spectrometers or two XRF spectrometers, including up to two sample preparation machines

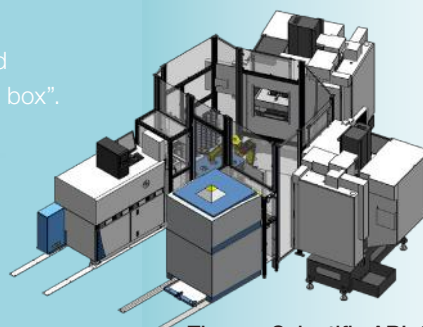
For unattended on-site analyses, these systems can be supplied in a standard container: the Thermo Scientific™ ARL™ QuantoShelter, also called “the lab in a box”.



**Thermo Scientific
ARL 9900 XRF with SMS-2300**



Thermo Scientific ARL QuantoShelter



**Thermo Scientific ARL SMS-3500 linking
two milling machines and two spectrometers**

What can X-rays do for you?

X-rays have been used to analyze and study materials since their discovery in 1895. Most people are familiar with applications of X-rays in imaging and medicine, but X-rays can also be used for chemical analysis. In fact, X-ray spectrometry is a proven, rapidly-growing technique for qualitative and quantitative elemental analysis of many types of materials. The ability of X-rays to penetrate matter enables non-destructive, non-contact analysis of solid and liquid samples with minimal sample preparation, high repeatability, and little operator training. X-rays are also used to study crystallographic structure of materials. The discovery of X-ray diffraction (Bragg's Law) enabled physicists, chemists, material scientists and metallurgists to study structure-property relationships leading to a multitude of new discoveries in materials science and technology.

Indeed, Thermo Fisher Scientific X-ray fluorescence and X-ray diffraction instruments are used in every field and industry, including mining and metals, construction, pharmaceuticals, consumer and food safety, environmental compliance, high-tech electronics, materials research, forensics, geology, archaeology and even art preservation.

Have you thought about using X-rays to solve your materials analysis problems?

Let the specialists at Thermo Fisher Scientific show you the way forward with the largest selection of innovative and reliable Thermo Scientific X-ray spectrometers for any budget and application. We can help you choose between the versatility of portable and benchtop EDXRF, the precision and speed of WDXRF and the unique structural insight of XRD.

Find out more at [**thermofisher.com/xray**](https://thermofisher.com/xray)

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