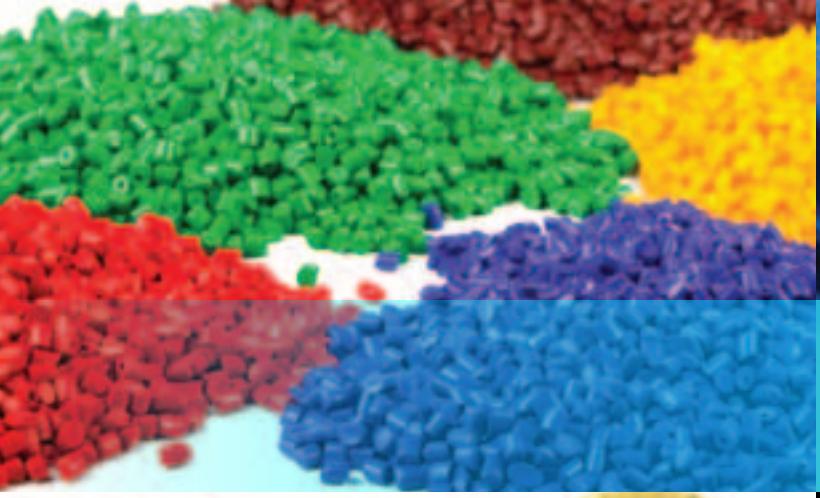
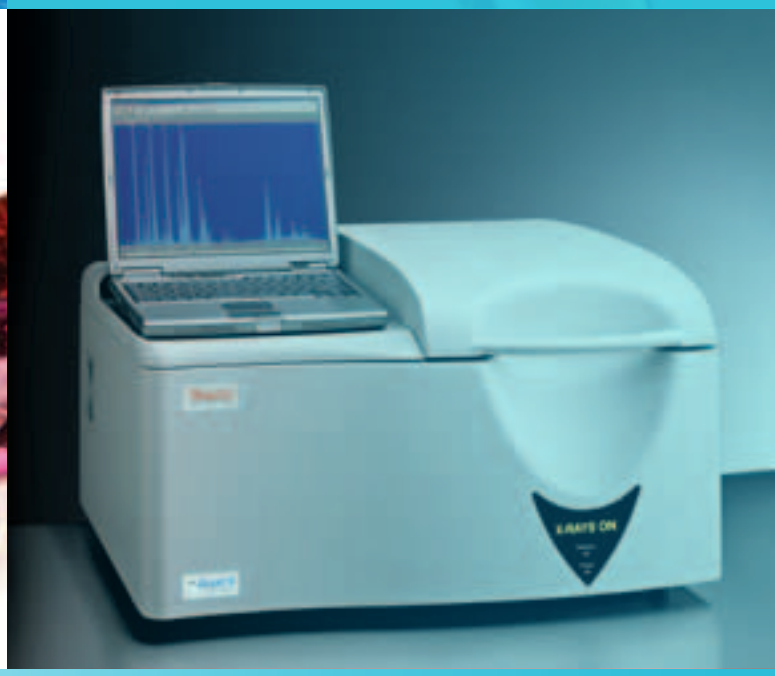


Thermo Scientific ARL QUANT'X
X-Ray Fluorescence Spectrometer



Inorganic Elemental Analysis
for any sample

Aerosol Particulate Filters • RoHS and WEEE Screening • Forensics and Investigation
Food and Consumer Safety • Oils, Lubricants and Wear Metals
Metallurgical Slags and Mining Ores • Cement, Feed and Alternative Fuels
Semiconductor and Magnetic Media

Thermo
SCIENTIFIC

Thermo Scientific ARL QUANT'X

The peak of EDXRF performance

The Thermo Scientific ARL QUANT'X Energy-Dispersive X-ray Fluorescence spectrometer is a state-of-the-art elemental analyzer for the most challenging analytical tasks in research and manufacturing.

Any analyst can now take advantage of:

- Rapid elemental analysis from F to U
- Sensitivity from <1 ppm up to 100%
- Measurement times 10-60 sec per element
- Many options for sample presentation
- Sample imaging with CCD camera
- Adjustable X-ray beam size from 1 to 15 mm
- Electrically-cooled Si(Li) detector
- Versatile XRF application software
- Thickness and layer analysis
- UniQuant™ for superior standard-less analysis
- Mechanical durability for trouble-free service
- Compact footprint and easy mobility
- Fully customizable and upgradeable on-site
- Easy to install and even easier to maintain

The ARL QUANT'X spectrometer is a complete package that includes proven hardware, all-inclusive software, on-site method development and technical support – all backed by the industry's most generous warranty and a responsive service organization with decades of expertise in hundreds of successful XRF applications.

Your search for a benchtop XRF analyzer is finally over. The ARL QUANT'X offers you an EDXRF solution without compromise

Exclusive technology inside the detector

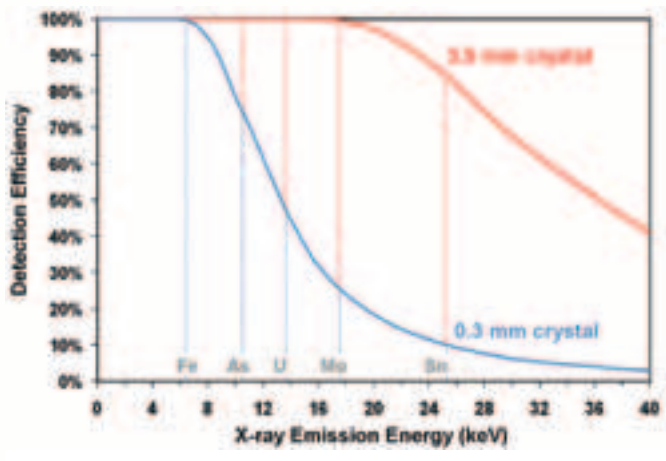
As a leading X-ray detector manufacturer for more than 40 years, our company knows the key parameters that define a detector's performance. After 4 generations of technical innovation, the Silicon Lithium-Drifted Si(Li) detector technology at the heart of the ARL QUANT'X continues to set the standard for sensitivity, speed and reliability.

Better resolution with lower crystal temperature

Lower operating temperature reduces electronic noise, improves resolution and makes the instrument less sensitive to environmental variations. Thermo Scientific advanced six-stage Peltier coolers can attain -100 °C. The performance of these electrically-cooled detectors is equivalent to that of conventional liquid-nitrogen (LN) designs.

Thicker crystal for better detection

High-energy X-rays emitted by atoms such as Mo, Ag or Cd penetrate silicon easily so a thick crystal is required to capture them effectively and prevent damage to sensitive components behind the crystal. The Si(Li) crystal used in the ARL QUANT'X is 10x thicker than other silicon crystals found in PIN and SDD detector types. As illustrated here, such detectors show a dramatic drop in efficiency for higher-energy fluorescence while a Si(Li) crystal does not. For this reason, PIN and SDD should be used primarily for light-element, low-energy analysis.



Wide crystal area for best detection limits

The Si(Li) crystal area of 15 mm² provides a larger "umbrella" for capturing photons. This is one of the main reasons why the ARL QUANT'X can achieve sub-nanogram sensitivity in a compact bench-top package.

Click GO and analyze anything in 3 clicks

Just say GO!

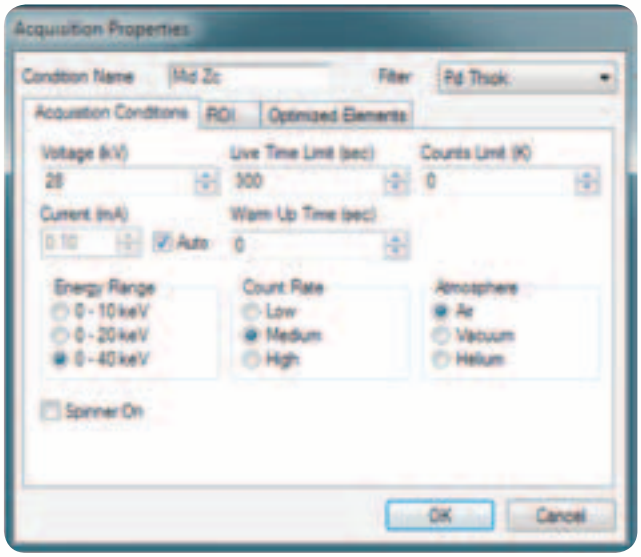
WinTrace software for the ARL QUANT'X opens the door to the limitless inherent flexibility of EDXRF, drawing on advanced algorithms and practices perfected through decades of research and experience. Collect and process up to eight filtered spectra per sample for any number of analytes, apply any one of seven analytical algorithms and include as many or as few calibration standards as you want. Once collected, spectra can always be reprocessed and recalculated off-line – anywhere. And automatic X-ray power adjustment guarantees that any sample – be it air filter, slag, metal, oil or rock – will be analyzed using its own unique optimal setting.

Simple and User-friendly

In today's computer-controlled world, even the most advanced hardware would be handicapped without flexible software designed to take full advantage of it. The Method Explorer interface provides advanced users with access to every parameter to obtain the highest throughput, sensitivity and selectivity in any application.

Intuitive

Add or remove elements simply by clicking on a periodic table. Review calibrations and results using a tree-type interface. Build your own methods from templates for common applications.



Flexible

Accurate extraction of peak intensities from the spectra is a critical first step for any quantitative analysis. Advanced deconvolution algorithms permit analysis of difficult matrices. The pre-defined settings work for most applications and can be easily customized for the most difficult cases.

Fundamental Parameters

The standard FP algorithms for the ARL QUANT'X work with any number of elements, standards, sample types, and excitation conditions. The software corrects for compound stoichiometry, specified concentrations and unanalyzed compounds. All equations are recalculated instantly for every sample.

UniQuant™ Advanced Standard-less Analysis

Going further than any other FP analysis, the optional UniQuant program uses all eight filters to collect all emission lines of all possible elements from fluorine to uranium. This complete spectral profile of the sample allows UniQuant to automatically correct for all possible overlap and background effects, which are especially complex in energy-dispersive spectra.

- All elements are always analyzed
- Each sample's unique physical properties, i.e. area, height, and mass are included in the calculation.
- Long-term changes in X-ray tube output are corrected using provided monitor samples.
- A variety of selectable reporting levels and formats present the results clearly for any type of user.
- Your ARL Quant'X comes completely pre-calibrated right out of the box and ready to tackle the most difficult analytical tasks.

The Sample Chamber

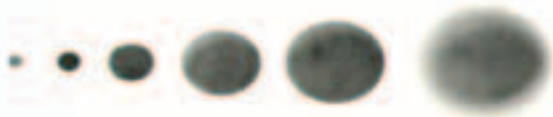
Analyze batches of samples and improve your productivity and extend the analytical benefits of laboratory-grade XRF to a wider range of samples with the large sample chamber and multiple sample automation and presentation options. Modular instrument design allows any sample handling option to be added or removed easily as the application changes.

Auto-samplers improve your productivity

Automated 10- and 20-sample carousels with or without sample spinner are designed for batch analysis of standard powder and liquid cups, pressed pellets, as well as aerosol or sediment filters.

Analyze small samples or small spots down to 1mm

Beam size can be adjusted from 15 mm for rapid screening down to 1 mm for research and investigative work.



Choice of atmosphere

Thanks to close coupling between sample and detector sulfur can still be detected under air atmosphere. Vacuum will help improve sensitivity for light elements in solids while helium flushing will be used for powders and liquid samples. The inert gas flush can be used with corrosive or unstable materials.

No problem with large samples

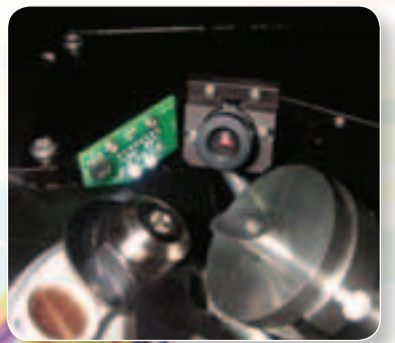
The single-sample tray and the large-sample deck can accept odd shaped, large and irregular samples, as long as they fit inside the chamber.

Chamber Extension

Even the largest of samples, such as cylinder blocks, boots, turbine fragments, automotive parts and any sample up to 37 cm (14.6 in) high can be analyzed with the optional chamber extension for semi-quantitative results without additional effort or preparation.

Watch your sample during analysis

With a CCD camera for sample imaging and adjustable X-ray beam diameter, the ARL QUANT'X allows you to select which part of the sample you like to analyze, thus combining all the analytical features, selectivity and sensitivity of a "bulk-analysis" spectrometer with the sampling flexibility typically found in "micro" analyzers.



Technical Specifications

X-ray Generator

Tube Target:	Rh standard, Ag optional
X-ray Power:	50 W maximum
Voltage Range:	4-50 kV in 1 kV steps
Current Range:	0.02-1.98 mA in 0.02 mA steps
Cooling:	Air-cooled
Selectivity:	8 filter positions
Beam Size:	1.0 mm – 8.8 mm, user adjustable

Basic Performance

Stability:	< 0.3% rsd over 8 hours
Sensitivity:	< 3 ppm for Fe and Pb in Conostan S12
Stray Lines:	< 0.015% med eV, < 0.05% high eV
Repeatability:	< 0.3% rsd at 1 million counts

Sample Chamber

Sample Size:	30.0 cm x 40.0 cm x 5.0 cm maximum
Extension 1:	20.0 cm max. sample height
Extension 2:	36.0 cm max. sample height
Atmosphere:	Air, Vacuum and Helium option
Sample holder:	1-sample stage and large deck
Auto-samplers:	10- and 20-position sample trays
Special Stages:	R-Theta (disk) and Y-Theta (wafer)
Sample Imaging:	CCD Camera, VGA resolution
Sample-spinner:	Available, software-controlled
Helium Flush:	15-65 psig input, 2.4 liters/min max.

Radiation and Electrical Safety

Interlocks:	Chamber lid (dual, separate circuits), X-ray tube, detector, warning light, side panels. Fail-safe circuit design.
Radiation:	< 0.25 mR/hr at a distance of 2 inches
Sound:	< 65 dbA at a distance of 1 meter
Compliance:	TÜV, UL, CE, GS

Computer and Software

PC Platform:	Laptop or Desktop computer
Processor:	Intel Core Family
Memory:	2 GB RAM, 250 GB hard drive
Communication:	Ethernet (2 ports), USB
Operating System:	Windows® 7
Elemental Range:	F-U, no limit on number of analytes
Exc. Conditions:	Up to 8 excitation conditions per sample
Spectrum Display:	Auto-peak ID, KLM markers, conditions and status, overlays, hardware control
Peak Processing:	Peak-profile XML fit, background filter
Standard Analysis:	Linear, quadratic, ratio, intensity or conc. correction, comprehensive custom FP.
Advanced Quant:	UniQuant FP for multi-matrix standardless analysis, full sample property correction, drift correction, factory precalibrated

X-ray Detector

Detector Type:	Si(Li) drifted crystal
Cooling Type:	6-stage Peltier
Crystal Area:	15 mm^2 PCD
Crystal Depth:	3.5 mm (3500 microns)
Energy Resolution:	< 155 eV PCD
Sensitivity:	Fluorine to Uranium
Temperature:	< 190 K

Pulse Processor

Processor Type:	32-bit Digital, 3 DSP
Channels:	2048, 20 eV / channel
Shaping Time:	1-40 µs, user adjustable
Count Rate:	Up to 100,000 cps (live)
Energy Range:	400 eV - 40960 eV
Deadtime effect:	< 3.0%
Pileup correction:	< 0.3%
Calibration:	Software-controlled

Site / Utility Requirements

Line Voltage:	110-240 VAC, 50/60 Hz
Spectrometer:	500 W PCD
Vacuum Pump:	1000 W
Ambient Temp:	0-30°C (32-86°F)
Humidity:	20-80%, non-condensing
Conditions:	Indoor use only

Weight and Dimensions

Height:	42.7 cm (closed), 91.5 cm (open)
Width x Depth:	72.4 cm x 59.7 cm
Weight:	80-91 kg (175-200 lbs), approx.

X-ray Elemental Analysis Capabilities from Thermo Fisher Scientific

Thermo Scientific Niton XL3t GOLDD+ XRF analyzer

ARL OPTIM'X compact XRF

ARLPERFORM'X advanced WDXRF

ARL 9900 X-ray WorkStation full XRF/XRD

ARL X'TRA powder diffractometer

X-ray spectrometry is a common and very powerful technique for fast, non-destructive, quantitative analysis of major, minor and trace components in all types of materials, including solids, powders, aqueous or organic solutions, and layered structures. It has numerous applications in every industry: pharmaceuticals, environmental monitoring, metals, cement, electronics, glass, polymers, ceramics, refractories, geochemistry, petroleum, chemicals and mining.

Thermo Fisher Scientific provides a full range of X-ray fluorescence and X-ray diffraction instrumentation (EDXRF, WDXRF, XRD, EDS, ESCA) that covers every aspect of X-ray spectrometry from routine to highly specialized research applications. From the versatile ARL QUANT'X to the ultra-precise ARL 9900 X-ray WorkStation, each instrument combines leading-edge technology with a long history of quality, durability and exceptional analytical performance.

www.thermoscientific.com/xray

Certified System ISO 9001

Thermo Fisher Scientific (Ecublens) SARL, Switzerland is ISO certified.

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Asia: Australia +61 39757 4300, China +86 21 6865 4588 or +86 10 8419 3588, India toll free 1800 22 8374, India +91 22 6716 2200, Japan +81 45 453 9220, New Zealand +64 9 980 6700, Other Asian countries +852 2885 4613 **Countries not listed:** +49 6184 90 6940

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