

# METAL ANALYSIS MADE FAST AND SIMPLE

Charting a New  
Course to the  
Future



**NITON**

THE NEW STANDARD IN PORTABLE XRF ANALYSIS

# Metal Analysis Made Simple and Effective in the

NITON, the worldwide leader in portable X-ray Fluorescence (XRF) analysis, has transformed metal analysis for the mining industry with a new generation of handheld XRF instrumentation – the XLi 500 Series XRF Analyzer, available with a full suite of isotope source configurations, and the XLt 500 Series XRF Analyzer with x-ray tube excitation. The XLi and XLt 500 Series analyzers are rugged, economical and lightweight portable instruments that provide fast and accurate elemental composition of exploration samples, ores, feeds, concentrates and tailings. NITON's portable analyzers offer real-time, on-site results, reducing turnaround times for results from days to seconds.

The **XLi 500 Series analyzers** incorporate state of the art electronics and advanced digital signal processing technology for rapid testing and optimal precision and accuracy. These analyzers are products of intensive research and development in portable XRF technology. NITON's XLi 500 Series analyzers are the easiest to operate, lightest in weight, most ergonomic, and the most technologically advanced isotope-based portable XRF instruments ever developed.



The **XLt 500 Series analyzer** offers the user the speed and efficiency of x-ray tube excitation, while greatly reducing the regulatory demands typically encountered with isotope based units. The XLt can be easily shipped from state to state and between most countries with minimal paperwork and expense.

## Key XLi and XLt 500 features include:

- High-strength, rugged environmentally sealed housing
- Lightweight, ergonomic and easy to operate
- Integrated touch-screen display with advanced and intuitive user interface
- A full suite of excitation options, including:
  - Miniaturized x-ray tube for high performance and reduced regulatory requirements
  - Traditional isotopes or Infiniton™ configuration – optimize performance for your application
- Integrated barcode reader and virtual keyboard for fast, easy data entry
- Remote operation + custom report generator capability from a Windows™-based PC
- Quick-swap lithium-ion batteries to allow continued use with minimal downtime
- Benchtop docking station to facilitate fixed-site or trailer use
- Bluetooth™ wireless communication compatibility
- Modular design allows future hardware upgrades at minimal cost

# Palm of Your Hand

## Analytical Performance

Both the XLi and XLt offer analytical performance that is unsurpassed in the industry, providing improved precision in a fraction of the time required using earlier generation XRF systems. Various excitation options, including the revolutionary miniature x-ray tube, are available depending on your particular analytical requirements. Some typical elements analyzed in mining include:

Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Rb,  
Sr, Zr, Nb, Mo, Ag, Sn, Sb, Ta, Hf, W, Pb, Bi

Standard and nonstandard element availability varies by the analyzer's configuration. Please contact NITON or your local NITON Representative to discuss and match your metal analysis needs with an appropriate excitation option.

### Bulk Sample Analysis

Bulk Sample mode provides rapid chemical composition analysis of soils, sediment drill cuttings, ores and concentrate tailings. The pre-set factory calibration allows for the simultaneous analysis of up to 25 elements. Whether testing is performed in situ or ex situ, sophisticated software automatically compensates for matrix variations between samples, allowing the operator to simply "point and shoot" any bulk sample without necessary data entry or additional calibrations. Results are obtained in seconds to minutes, depending on the level of precision required. This mode is ideal for the analysis of contaminants (less than 1%) and in conjunction with Industrial Bulk mode, provides the user with a complete analysis of all majors and traces in any bulk material.

### Bulk Sample Mode

Element Set	Excitation Source
Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Rb, Sr, Ag, Cd, Sn, Sb, Hg, Pb	Miniaturized X ray Tube
Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Rb, Sr, Zr, Nb, Se, Mo, Hg, Pb	<sup>109</sup> Cd, 10mCi (370 MBq)
Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Rb, Sr, Pd, Cd, Ag, Sn, Sb, Cs, Ba, Pb	<sup>241</sup> Am, 30mCi (1110 MBq) <i>Infiniton</i>
Pd, Ag, Cd, Sn, Sb, Ba	<sup>241</sup> Am, 14mCi (520 MBq)
K, Ca, Sc, V, Ti	<sup>55</sup> Fe, 20mCi (670MBq)

- Special calibrations are also available for the following elements: U, Au, Th, Ta and W.
- Please note that some elements may not be suitable for the Infiniton configuration. Contact NITON or your local NITON representative for additional details.

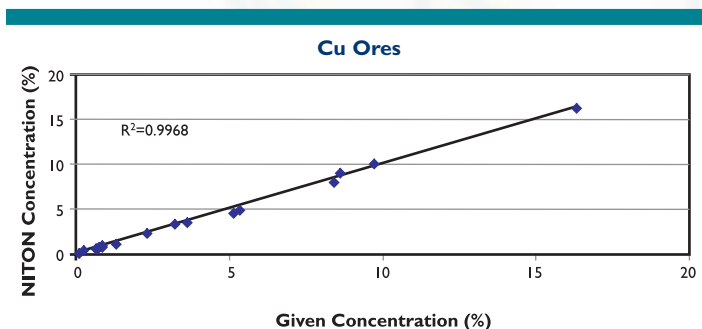
### Industrial Bulk Sample Analysis

Industrial Bulk mode utilizes an advanced Fundamental Parameters (FP) software algorithm to provide rapid chemical composition analysis of any ore, concentrate or tailing. The FP algorithm offers the user both versatility and accuracy for elemental concentrations ranging from tenths of a percent to 100 percent. When systematic biases occur due to variations in sample matrix or in light element composition (elements lighter than Calcium on the periodic table that cannot be directly analyzed using portable XRF), Industrial Bulk mode allows the user to integrate matrix-specific calibration factors in order to improve accuracy. These matrix factors are easily calculated for each element using NITON's CorrectCalc™ software.

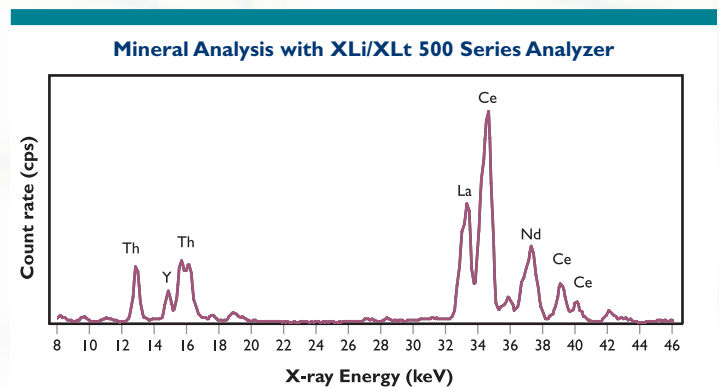
### Industrial Bulk Mode

Element Set	Excitation Source
Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Rb, Sr, Zr, Nb, Se, Mo, Sn, Pd, Ag, W, Hg, Pb, Bi	Miniaturized X ray Tube
Cr, Mn, Fe, Co, Ni, Cu (Hf), Zn (Ta), As, Rb, Sr, Zr, Nb, Se, Mo, Hg, Pb (Re)	<sup>109</sup> Cd, 10 mCi (370 MBq)
Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Sr, Zr, Pd, Ag, Sn, W, Pb, Bi	<sup>241</sup> Am, 30mCi (1110MBq) <i>Infiniton</i>
Pd, Ag, Sn	<sup>241</sup> Am, 14mCi (520 MBq)
Ti, V	<sup>55</sup> Fe, 20mCi (670MBq)

- Two individual modes are required and supplied to analyze for all the elements listed for the <sup>109</sup>Cd isotope above.



Correlation for Cu Ores using data generated from an XLt 500 compared to concentrations obtained from a conventional laboratory method like AA (Atomic Absorption). The correlation shows that the NITON portable analyzer can provide laboratory quality results on-site in seconds.



Qualitative spectrum generated using an XLi 500 and NITON Data Transfer (NDT) software for a monazite ore sample. In addition to a complete quantitative analysis of up to 25 elements, the analyzer also generates and stores a qualitative spectrum for each analyzed sample. This allows for quick and simple peak identification and report generation.

## Testing Applications

*In situ* testing, using the XLi or XLt directly on the ground, rock face, Reverse Circulation (RC) samples, Rotary Air Blast (RAB) samples or drill cores, allows for a large number of data points to be collected in a short time. It is a fast and effective way of delineating veins, grading ore, and characterizing potential environmental hazards. For example, NITON's XLi and XLt 500 Series analyzers are the instruments of choice for the following mining-related applications:

- **Ore-body Assessment**  
Assess ore-grade on-site without the wait or cost associated with an outside laboratory. Spot screen for elemental identification immediately.
- **Mill Heads, Tailing and Concentrate Analysis**  
Analyze feeds, concentrates and tailings quickly and accurately to establish and track the efficiency of the extraction and enrichment process.
- **Mine Mapping and Grade Control**  
Guide drilling program and manage excavation and blasting by measuring multiple samples on-site with the XLi/XLt 500 Series analyzer in real-time.
- **Mineral Exploration**  
Determine soil, sediment and drill hole sample geochemistry in the field, to utilize exploration expenditure more efficiently.
- **Environmental Monitoring**  
Monitor low-levels of metal concentrations in by-products and waste streams on-site.

Ex situ testing of prepared samples provide rapid laboratory-grade data quality without the wait or costs associated with using an outside lab or off-site instrumentation. Since XRF analysis is non-destructive, analyzed samples may be archived or sent to a laboratory for confirmation testing. Both the XLi and XLt 500 Series analyzers are supplied with a mineral sampling and preparation kit, complete with grinding apparatus, sieve set, and x-ray sample cups.

In addition to the higher throughput and more precise analytical performance of the XLi and XLt analyzers, NITON's instruments come standard with a suite of software tools to enhance their value to your business. NITON's PC-compatible NDT© (NITON Data Transfer) software offers powerful data reporting functions, remote operation for bench-top use, and automatic analytical calculation.

NITON's proprietary operating system and NDT software do not allow modification of data or deletion of individual readings. This ensures both the integrity and traceability of the data generated.

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# NITON is the Answer to All Your Metal Analysis Needs



<b>Weight</b>	XLi 1.7 lbs (0.8 kg) XLt 3.0 lbs (1.4 kg)
<b>Dimensions</b>	XLi 11.5 x 3.5 x 3.0 inches (292 x 89 x 76 mm) XLt 9.75 x 10.5 x 3.75 inches (248 x 273 x 95 mm)
<b>Excitation Source</b>	XLi <b>Primary</b> <sup>109</sup> Cd Maximum 40mCi (1,480 MBq) or <sup>241</sup> Am Maximum 30mCi (1110MBq)-Infiniton <b>Secondary</b> <sup>241</sup> Am Maximum 14mCi (520 MBq) and/or <sup>55</sup> Fe Maximum 20mCi (740 MBq) XLt Miniature x-ray tube and power supply (40kV/50uA maximum)
<b>X-ray Detector</b>	High-performance Si-PIN detector, Peltier cooled.
<b>System Electronics</b>	Hitachi SH-4 CPU ASICS high-speed DSP 4096 channel MCA
<b>Batteries</b>	(2) Rechargeable Lithium-ion battery packs with Quick-swap capability. 6–12 hours (maximum depends on platform and duty cycle), 2 hour recharge cycle.
<b>Display</b>	Backlit VGA touch screen LCD
<b>Analysis Range</b>	Up to 25 Standard elements in the range K(19) to Pu(94) Nonstandard in-range elements available at additional cost
<b>Testing Modes</b>	Bulk Sample Mode      Industrial Bulk Mode      Empirical Mode
<b>Data Storage</b>	Internal: 3000 readings with x-ray spectra (maximum)
<b>Standard Accessories</b>	<ul style="list-style-type: none"> <li>■ Soil Sampling Kit</li> <li>■ Lockable, shielded waterproof carrying case</li> <li>■ Shielded belt holster</li> <li>■ Spare lithium-ion battery pack with holster</li> <li>■ 110/220 VAC battery charger/adapter</li> <li>■ PC interface cable</li> <li>■ NDT® (NITON Data Transfer) PC software</li> <li>■ Safety Lanyard</li> <li>■ Check/verification standards</li> </ul>
<b>Training</b>	U.S. – Call 1-800-875-1578 for schedule of no-cost radiation safety training in your area. Outside U.S. – Please contact your local NITON representative for training information





THE NEW STANDARD IN PORTABLE XRF ANALYSIS

NITON Corporation was founded in 1987 by Professor of Physics, Dr. Lee Grodzins, to develop and market products using innovative x-ray and gamma-ray technologies. The company's first two products were patented radon-gas detection systems. Later, after two years of intensive development assisted by a series of federal research grants, the company introduced the first ever one-piece XRF analyzer, the NITON XL-309 Lead Paint Analyzer, in January, 1994.

NITON built its initial reputation for quality, value and innovative design with the XL-309 lead analyzer, and continued this tradition with the introduction of its first handheld multi-element environmental analyzer, the XL-700 in 1995.

In just a few years since that introduction, NITON LLC has completely transformed the world of portable XRF analysis. NITON has thousands of XRF analyzers in-use worldwide, in remote locations and harsh environments from the Australian

outback to Alaska to Equatorial Guinea. No other XRF instrument company has ever sold analyzers at this pace. NITON's analyzers are in use in a wide variety of testing applications, including the analysis of metal alloys, mining samples, paints, soils, powders, filters and coatings. Every member of the NITON family of XRF analyzers is easy to use, economical, and priced to provide unsurpassed value.

NITON continues to invest money into the research and development of advanced and higher performing XRF analyzers. In 2003, the XLi with Infiniton and XLt were awarded the prestigious R&D 100 Award for technological innovation. The new XLi and XLt 500 Series XRF analyzers are just the latest examples of that commitment to R&D excellence.

To quote NITON President and CEO, Hal Grodzins: "This is just the beginning..."

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