ENVIRONMENTAL ANALYSIS FOR THE NEW MILLENIUM

Charting a New Course to the Future

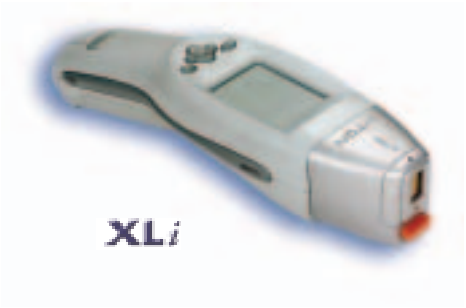
NITON

THE NEW STANDARD IN PORTABLE XRF ANALYSIS

ENVIRONMENTAL ANALYSIS FOR THE NEW MILLENIUM

In 1994, NITON® Corporation revolutionized the environmental and metal analysis industries with the introduction of the first hand-held x-ray fluorescence (XRF) analyzer which had the performance of a laboratory unit combined with unmatched portability and ease of use. Since that time, **NITON** *products have become the industry standard for elemental analysis in applications ranging from environmental site characterization and soil analysis to thin film and coatings measurements.*

Once again, **NITON***, the worldwide leader in portable XRF analysis, has transformed the analytical instrument industry with a new generation of handheld environmental XRF instrumentation – the XLi 700 Series XRF Analyzer, available with a full suite of isotope source options including the Infiniton™ source, and the XLt 700 Series XRF Analyzer with x-ray tube excitation.*



The **XLi 700 Series** analyzer incorporates state of the art electronics and advanced digital signal processing technology for rapid testing and enhanced precision and accuracy. They are products of intensive research and development in XRF for environmental testing. NITON's XLi 700 Series analyzers are the easiest to operate, lightest in weight, most ergonomic, and the most advanced isotope-based environmental XRF instruments ever developed.

NITON offers various isotope options to best optimize performance for your environmental application. For those customers with project requirements that call for the highest performance available in field portable XRF, NITON offers the XLi 702 with a 40mCi ^{109}Cd source. This isotope provides the user with the best sensitivity for many of the crucial elements measured in bulk material, including lead, mercury, and arsenic. Available with an optional 14mCi ^{241}Am source, this configuration is the ideal high performance environmental analyzer for heavy metals testing.

NITON's patent-pending XLi 712 with Infiniton is the first isotope-sourced portable XRF environmental analyzer that never slows down or requires source replacements. The XLi 712 with Infiniton source employs a proprietary combination of source, detector and software that enables the NITON analyzer to rapidly measure up to 25 elements in a sample. Offering all-purpose performance for many key elements in most environmental applications, the NITON XLi 712 with Infiniton can be a viable low-maintenance alternative when the ultra high performance of the 40mCi ^{109}Cd source or the reduced regulatory requirements of the miniature x-ray tube are not required.

The **XLt 700 Series** analyzer offers the user the speed and efficiency of x-ray tube excitation, while greatly reducing the regulatory demands 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 700 features include:

- Patented high-speed electronics for superior performance
- 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 source – optimize performance for your application
- Quick-swap lithium-ion batteries to allow continued use with minimal downtime
- Integrated barcode reader for fast, easy data entry
- Remote operation + custom report generation capability from a Windows™-based PC
- Lightweight, ergonomic and easy to operate
- High-strength, rugged environmentally sealed housing
- Benchtop docking station to facilitate fixed-site or trailer use
- New features and software upgrades via internet
- Internet-based diagnostics and troubleshooting

Analytical Performance

The XLi and XLt offer analytical performance that is unsurpassed in the industry, providing improved precision in a fraction of the time required using NITON's earlier systems. Various excitation options, including the x-ray tube, are available depending on the particular analytical requirements. Please see our Performance Parameter Sheets or contact NITON or your local NITON Representative for information concerning excitation options and analytical capabilities, long-term cost of ownership and regulatory requirements.

NITON has the solution to a broad range of applications

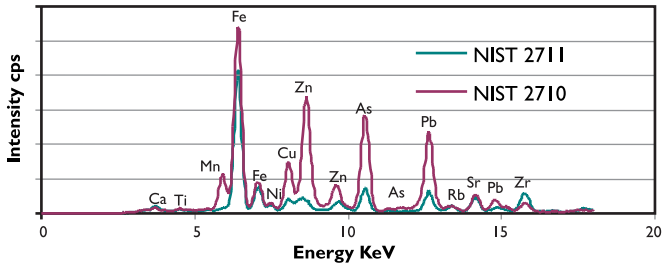
Bulk Sample Mode

Bulk sample mode provides rapid chemical composition analysis of soil, sediment and other thick, homogeneous samples. The pre-set factory calibration allows for the simultaneous analysis of up to 25 elements, including all 8 RCRA* metals, in any bulk material with no requirement for on-site calibrations or standards. Whether testing is performed *in situ* or *ex situ*, sophisticated software automatically compensates for matrix variations from sample to sample, allowing the operator to simply "point and shoot" any bulk sample without unnecessary data entry or additional calibrations. With typical testing times of less than 60 seconds, the XLi or XLt 700 series analyzers are the ideal on-site companions.

In situ testing with the XLi or XLt placed directly on the ground or on bagged samples, allows the user to collect a large number of data points in a short time. It is the fastest and most effective way of delineating contamination patterns and achieving a more economical site remediation. NITON's XLi and XLt 700 Series analyzers are in full compliance with the US EPA Method 6200, "Field Portable XRF Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment," and are the industry standard instruments for:

- Site Characterization
- On-Site Clearance Screening
- Soil Stabilization Control
- Remediation Quality Control

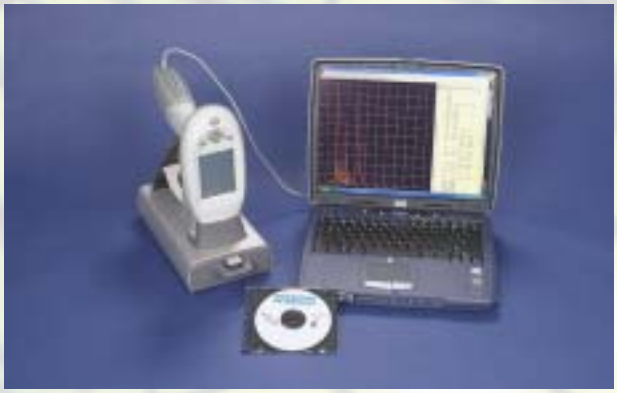
Qualitative Comparison of Soils using XLi/XLt 700 Series Analyzers



Qualitative spectrum generated using an XLt 700 and NITON Data Transfer (NDT) software for two NIST certified soil reference standards at different concentration (ppm) levels. 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.

Ex situ testing of properly prepared samples with the XLi and XLt provides rapid laboratory-grade data quality without the wait or the costs associated with using an outside lab. Since XRF analysis is non-destructive, analyzed samples may be sent later to an accredited laboratory for result confirmation. Both the XLi and XLt 700 Series analyzers are supplied with a soil sampling kit for *ex situ* analysis, complete with soil grinding apparatus, sieve set, and x-ray sample cups.

* Resource Conservation and Recovery Act (RCRA) metals are As, Se, Ba, Cd, Cr, Ag, Hg, Pb.



Thin Sample Mode

Thin sample mode provides rapid analysis of sample types including dust wipes for lead inspection, risk assessment and OSHA compliance, and various other filter media. With the XLi and XLt 700 Series factory calibrations and analysis software, on-site testing of the following thin film sample types is made simple and rapid:

- Pb in dust wipe as detailed by the US EPA-ETV (Environmental Technology Verification) Program and Industrial Hygiene applications
- TSP, PM10, and PM2.5 for airborne metal particulate monitoring
- ion-exchange filter media for suspended and dissolved metals in liquids
- 25mm and 37mm diameter cellulose-ester filter used for OSHA compliance and Industrial Hygiene.

Results are reported in µg of loading per sample. Using the area, volumetric flow-rate, and/or air sampling time, the results can be easily converted to the appropriate concentration units.

The XLi and XLt 700 Series are ideal for clearance testing of metals for negative exposure and residential risk assessment. NITON's portable XRF analyzers have been proven in US EPA-ETV studies for Lead in dust wipe testing and are the only XRF analyzers listed in NIOSH Method 7702 for airborne lead monitoring.

700 Series analyzers are used for on-site screening of worker exposure monitoring filters for industrial hygiene and safety testing. Filter cassettes may be tested immediately following collection, or at mid-points throughout the sampling process to rapidly determine if the working environment is safe or if workers are being appropriately protected.

XLi and XLt 700 Series analyzers enable the user to monitor airborne metal contaminants on-site and in real-time to maximize worker's safety and productivity, improve site containment and correct substandard work practices before problems result.

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 reporting functions, remote operation and automatic analytical calculation.

NITON's proprietary operating system and NDT software do not allow users to modify data or delete individual readings. This assures the integrity of the data generated .

Users also depend on NITON 700 Series Analyzers for:

Lead-Based Paint Screening

XLi 700 Series paint-testing modes are ideal for lead based paint screening applications. Features and performance include the following:

- Rapid, 95%-confidence Positive/Negative determinations for HUD lead-in-paint action levels from 0.5–2.2 mg/cm2. Results in as little as one second.
- No fixed reading times, no manual substrate corrections, no inconclusive ranges and no inconclusive results.

Coating Analysis

- Coating, paints, glazes and other thin samples for environmental, industrial, and/or quality control.
- Metal coatings and plating for industrial applications including coating thickness for nickel, chromium, zinc, and other metals.

Other Applications

- Wood Preservatives (CCA).
- Construction and Demolition(C&D) Recycled Materials Inspection.
- Majors and impurites in Minerals and Catalysts.

Weight	XLi 1.7 lbs (0.8 kg) XLt 3.0 lbs (1.4 kg)
Dimensions	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)
Excitation Source	XLi *Primary* ^{241}Am Maximum 30mCi (1,110 MBq) – Infiniton, or ^{109}Cd Maximum 40mCi (1,480 MBq) *Secondary* ^{241}Am Maximum 14mCi (520 MBq) and/or ^{55}Fe Maximum 20mCi (740 MBq) XLt Miniature x-ray tube and power supply (40kV/50uA maximum)
X-ray Detector	High-performance Si-PIN detector, Peltier cooled.
System Electronics	Hitachi SH-4 CPU ASICS high-speed DSP 4096 channel MCA
Batteries	(2) Rechargeable Lithium-ion battery packs with Quick-swap capability. 6–12 hour (maximum depends on platform and duty cycle), 2 hour recharge cycle.
Display	1/4 Backlit VGA touch screen LCD
Analysis Range	Up to 25 Standard elements in the range Ti(22) to Pu(94) Some Nonstandard in-range elements available at additional cost.
Testing Modes	Bulk Sample Mode Thin Sample Mode, including Dust Wipe mode, 37mm Filter mode, User-Defined Thin Sample mode
Data Storage	Internal: 3000 readings with x-ray spectra (maximum)
Standard Accessories	Soil Sampling Kit/Thin Sample Kit (varies by model and configuration) Lockable, shielded waterproof carrying case Shielded belt holster Spare lithium-ion battery pack with holster 110/220 VAC battery charger/adapter PC interface cable NDT© (NITON Data Transfer) PC software Safety Lanyard Check/verification standards Integrated barcode scan engine for rapid/reliable entry of sample information
Training	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

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NITON was founded in 1987 by Professor of Physics, Dr. Lee Grodzins, to develop and market instrumentation 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 portable 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 hand-held 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 XRF analysis. NITON has thousands of XRF analyzers installed worldwide. No other XRF instrument company has ever sold analyzers at this pace. Many are in use by businesses and government agencies who build their remediation and characterization strategies around these rugged and reliable instruments in order to ensure the health and safety of children, adults and the environment in which they live.

NITON continues to invest money into the research and development of advanced and higher performing XRF analyzers. The new XLi 700 and XLt 700 Series environmental analyzers are 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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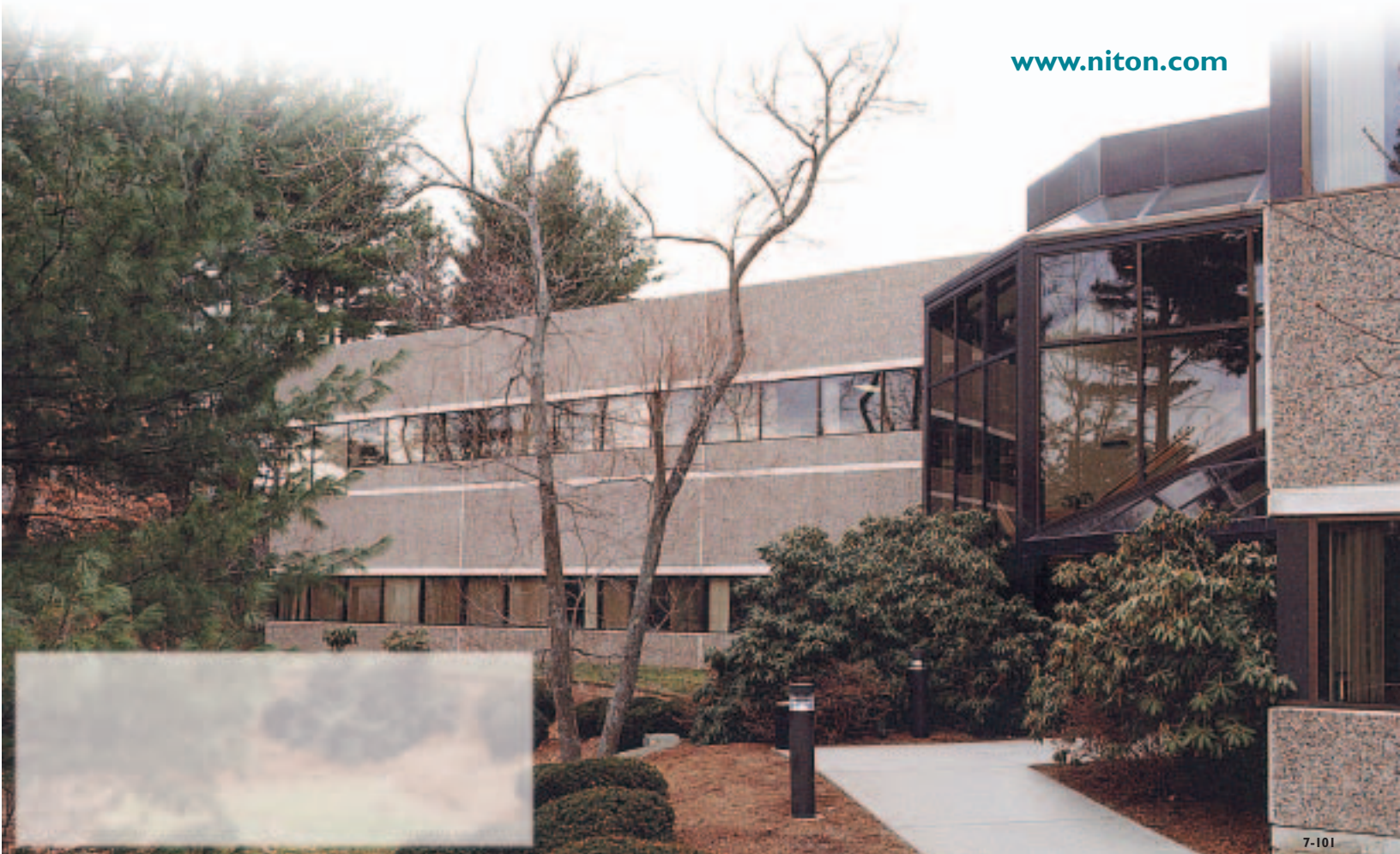

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