



NITON LLC

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NITON XL-309 Dual Detector Lead Paint Analyzer

DESCRIPTION OF THE TECHNOLOGY

With support from the Environmental Protection Agency's (EPA) Small Business Innovation Research (SBIR) Program, NITON LLC, has developed and commercialized a unique instrument to detect lead in paint that solves the problems encountered with x-ray fluorescent analyzers. The NITON XL-309 Dual Detector is compact, lightweight, and battery operated. It produces rapid, accurate measurements of lead and can be equipped with the capability to be used for the following applications:

- ◆ Lead in paint, independent of the composition, thickness, and substrate of the paint.
- ◆ Lead in soil for site characterization, clearance screening, and remediation quality control.
- ◆ Lead in dust wipes for lead inspection, risk assessment, and site clearance.
- ◆ Lead on filters for tracking workers' exposure to harmful airborne lead.

The NITON analyzer uses a ^{109}Cd source to measure the concentration of lead in paint, even when covered by 15 or more layers of non-lead paint of unknown thickness and composition. This results in no substrate correction and simple, point-and-shoot operation on any surface. Positive/negative classifications are displayed automatically when 95 percent confidence is achieved, and the results are continuously displayed and updated. In some cases, results are obtained in as little as 1 second with no inconclusive ranges. Equipped with a fully automated data entry and onsite report generation capability, the

XL-309 is a powerful onsite package capable of solving the most challenging lead-hazard problems.

SIGNIFICANCE OF THE TECHNOLOGY

Lead in paint has been associated with a number of environmental and health risks. Exposure of pregnant women to lead can result in premature birth, low birth weight, or spontaneous abortion. Lead exposure in infants and young children may lead to decreased intelligence scores, decelerated growth, and hearing problems. Also, exposure of adults and children to high levels of lead may cause brain and kidney damage. NITON's device helps detect and subsequently eliminate the health risks associated with lead-based paint (LBP).

Lead in soil contamination, at residential and industrial sites, poses numerous environmental, safety, and remediation problems. Depending on the source(s) of lead, the contamination may be highly localized or distributed extensively about a property. For example, if the main source of lead is due to external house paint, then the lead in soil is expected to be highest near the dripline of the house and decrease rapidly away from the structure. Conversely, if the lead source is from a nearby industry or large lead abatement project, the soil contamination may be pervasive throughout the property. Only a thorough site assessment involving a detailed sampling pattern will produce an accurate contamination profile of such sites.

The NITON 300 series analyzer, as part of a soil-testing strategy, can reduce the cost and disruption of soil remediation. The NITON analyzer is in full compliance with U.S. EPA Method 6200, "Field Portable XRF Spectrom-

SBIR Impact

- ◆ NITON has developed and commercialized the NITON XL-309 Dual Detector, which produces accurate measurements of lead in paint independent of the composition, thickness, and substrate of the paint.
- ◆ The analyzer uses a ^{109}Cd source to measure the concentration of lead in paint, even when covered by 15 or more layers of non-lead paint of unknown thickness and composition.
- ◆ The device also can be used for detecting lead in soil, dust wipes, and on filters.
- ◆ Since receiving SBIR funding 6 years ago, the NITON XL-309 dual detector has become the industry standard for lead in paint analyses and has evolved into a complete lead analyzer.



The NITON XL-309 dual detector has become the industry standard for lead in paint analyses and has evolved into a complete lead analyzer, capable of detecting lead in soil, dust wipes, and on filters.

etry for the Determination of Elemental Concentrations in Soils and Sediments” for lead analysis. When used as part of a remediation project, it is expected to reduce off-site analytical costs, reduce the amount of soil to be processed, reduce the time required for remediation, and reduce or perhaps eliminate the need to remove contaminated soil for storage at hazardous waste landfills. It is expected that these benefits would greatly increase the overall amount of soil remediation because costs would be substantially lower for many sites.

Dust wipe analysis with the NITON 300 series analyzer is a non-destructive method that provides real-time analytical data that are invaluable when conducting a risk assessment after abatement of a lead hazard. It conclusively determines whether clearance criteria have been met while abatement workers are still onsite, eliminating the remobilization and re-cleaning associated with failed clearance tests while allowing for re-occupancy of the dwelling in less time, at a lower cost, and with less inconvenience to the occupants.

Filter analysis provides onsite screening of workers’ exposure for industrial hygiene and safety testing. Filter cassettes may be tested immediately following collections, or at midpoints throughout the sampling process, to rapidly determine if the working environment is safe, or if workers are being appropriately protected. Environmental and industrial filters also may be checked during sampling, offering close-to-real-time analysis and the ability to immediately correct possibly erroneous procedures and environmental protection. NITON analyzers offer unprecedented speed-to-results to ensure the safety of workers and are listed in National Institute for Occupational Safety and Health Method 7702 for airborne lead monitoring.

COMMERCIALIZATION SUCCESS

Since receiving SBIR funding 6 years ago, the NITON XL-309 dual detector has become the industry standard for lead in paint analysis and has evolved into a complete lead analyzer. From LBP to soil to dust wipes, it is an invaluable tool to ensure the safety of children and adults, and the environment in which they live.

With thousands in use worldwide, NITON’s award-winning 300 series lead analyzer has become the instrument of choice for the lead analysis industry. In November 2001, NITON participated with the 300 series analyzer in the “Evaluation of Field Portable Measurement Technologies for Lead in Dust Wipes” conducted by EPA’s Environmental Technology Verification Program to evaluate the performance of commercially available field analytical technologies for analyzing dust wipes for lead. Data from the XL-300 series showed excellent agreement with the estimated lead value for the range of samples analyzed, with very few false negative results.

AWARDS AND COMPANY HISTORY



In recognition of its technological innovation, NITON was a finalist for the 1994 Discovery Award and received the prestigious R&D 100 Award in 1995. NITON also received the Lead Tech Product of the Year Award in 1995. NITON’s headquarters are located in Billerica, MA, and the company has facilities in North Kingstown, RI; Bend, OR; and Garching bei München, Germany. NITON also has satellite sales and service offices in countries throughout the world.

What is the SBIR Program?

EPA’s Small Business Innovation Research (SBIR) Program was created to assist small businesses in transforming innovative ideas into commercial products. The SBIR Program has two phases—Phase I is the feasibility study to determine the validity of the proposed concept and Phase II is the development of the technology or product proven feasible in Phase I. EPA also offers Phase II Options to accelerate the commercialization of SBIR technologies and to complete EPA’s Environmental Technology Verification (ETV) Program. For more information about EPA’s SBIR Program and the National Center for Environmental Research, visit <http://www.epa.gov/ncer/sbir>.