OLYMPUS®

Your Vision, Our Future

Handheld XRF

DELTA Series

DELTA Handheld XRF
for Environmental Inspection

The Powerful Handheld XRF for Fast, Decisive Results

The DELTA Handheld XRF

for Environmental Inspection

The DELTA Environmental X-ray fluorescence spectrometer is a powerful handheld XRF designed for complete environmental investigations of metal contaminants in soils, sediments, fluids, dust wipes, and filters. This high-power, high-performance, field-ruggedized handheld XRF with hot-swappable batteries offers you 24/7 heavy-duty operation anywhere you use it.

The Powerful Handheld XRF That Can Be Taken Anywhere

Get Fast Results for Immediate Action

The DELTA can be used to identify and quantify lead (Pb), arsenic (As), mercury (Hg), chromium (Cr), and other contaminant metals quickly and accurately. Take it anywhere to get fast results for site characterizations, property evaluations, contamination tracking, hazardous waste screening, remediation monitoring, and regulatory compliance. Requiring little to no sample preparation, the DELTA Environmental Analyzer is the ultimate tool for screening large sites and for analyzing samples such as bagged soil, sediments, cores, fluids, dust wipes, surfaces and filters.

DELTA Environmental Complies with Global Methods

Olympus strives to play an integral role in society by putting our technologies to work to help develop a better future. We do this by taking up the challenge of making the hidden visible. Pollutant metals are usually hidden from view, but with Olympus X-ray fluorescence technology, we make them visible in the global effort to help make the world a cleaner, greener place. Portable XRF measurements are made to help ensure that dangerous levels of toxic metals are not present in the land, water or air where we live, work, play, cultivate food or obtain water.

US EPA 6200

On-Site Screening of Heavy Metals in Soil and Sediments

Method 6200 was first developed in the mid-1990s and is still strong worldwide for in-situ (handheld) and intrusive (portable) XRF methods. It provides basic portable XRF quality assurance methods including calibration verification, determination of instrument precision, accuracy and LODs to create a standard field XRF method. Following the method decreases sampling error by increasing the number and quality of samples tested to improve overall data quality. It suggests XRF testing methods include in-situ soil, bagged soil, and fully prepped soil samples. Method 6200 does recommend confirmation of 5-10% of samples tested by portable XRF with an EPA Lab method. Overall, it recommends XRF as a fast, powerful, cost-effective technology for site characterization with the analytical benefits of more and better field testing to improve site understanding.

ISO/DIS 13196

Soil Quality Screening

This draft describes XRF as a quick method for on-site screening of heavy metals and for the determination of total elemental compositions of soil samples. It is similar to EPA Method 6200, but it does not specify elements, it encourages the objectives of the project to dictate the elements. It calls for reasonable sample preparation and quality control for portable and handheld X-ray fluorescence measurements of heavy metals in soil.

EPA TCLP HAZMAT Classification

The Rule of 20 for Cost Savings on 8 TCLP RCRA Metals

The DELTA can be used to follow the “Rule of 20” for cost savings in relation to the TCLP HAZMAT Classification Process. If results are significantly less than the TCLP regulatory limit, or are less than 20 times the TCLP regulatory limit, time-consuming and costly TCLP/Lab testing can be avoided.

US EPA, NIOSH, and OSHA

Residential and Industrial Hygiene Monitoring of Pb

The DELTA Environmental Analyzer complies with EPA, NIOSH, and OSHA XRF methods of monitoring Pb on surfaces, in paint, dust, and flakes, and on industrial airborne particle monitors and filters. These methods help protect the health of families and industrial process workers.

DELTA Detection Limits (LOD) Are Well Within Regulatory Action Levels

Pb Source	Typical Reg. Action Level	DELTA Classic Plus LOD	DELTA Premium/Professional LOD
Painted surface	1 mg/cm^2 (0.5%)	0.3 µg/cm^2	0.1 µg/cm^2
Floor dust	40 mg/ft^2 (40 mg/wipe)	3 µg/wipe	1 µg/wipe
Children play area soil	400 ppm	5–10 ppm	1–4 ppm

Limits of Detection were taken for more than 30 seconds with optimized beam conditions. Standards used were in clean, homogenous, best case interference free matrices.

Environmental Inspections

DELTA Analyzer Provides Fast, Decisive Results

Soils

The analysis of soil for contaminant metals is the most common environmental application of handheld X-ray fluorescence spectrometry. Simple screening for toxic metals is performed by placing the analyzer directly on the soil, in-situ. The DELTA provides ease in detecting metals for site characterization, contamination tracking, remediation monitoring, property evaluations, extreme-weather debris migration studies, construction and demolition waste sorting, industrial or mining community perimeter checks, agriculture soil inspections, and hazardous waste screening for disposal classification. Quantitative measurements of the metals are based on robust preprogrammed calibration methods that may be refined by the user.

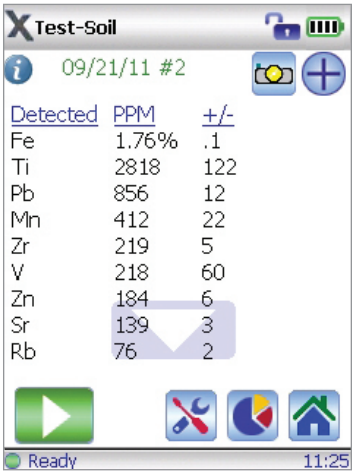
Surfaces, Dust Wipes, and Filters

The DELTA is used to measeure Pb on surfaces and in dust, paint chips, and flakes. The DELTA can also be used to check filters for airborne metals from welding, construction, mining, manufacturing, and paint removal activities.

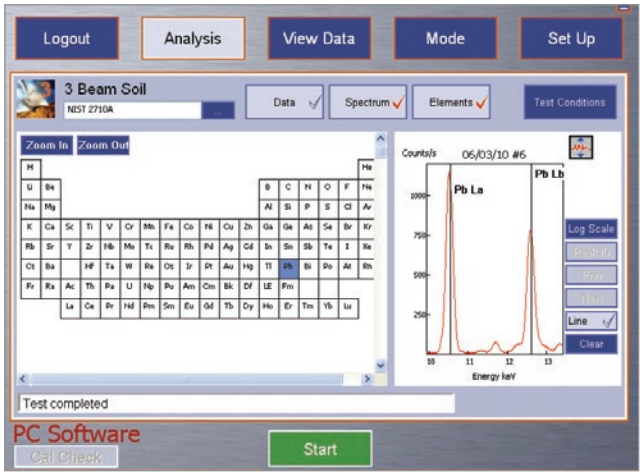
Liquids and Fluids

The DELTA can be used to inspect runoff streams, industrial-waste fluids, HAZMAT and oil spills for metal contaminants before they seep into the soil, or reach ground water and drinking water sources.

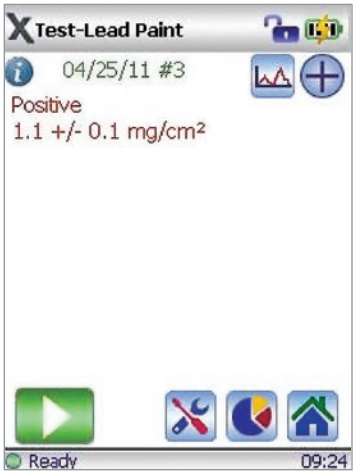
DELTA Data Analysis Screens



Quantitative Results on Handheld Screen



Qualitative Spectral ID on PC Software



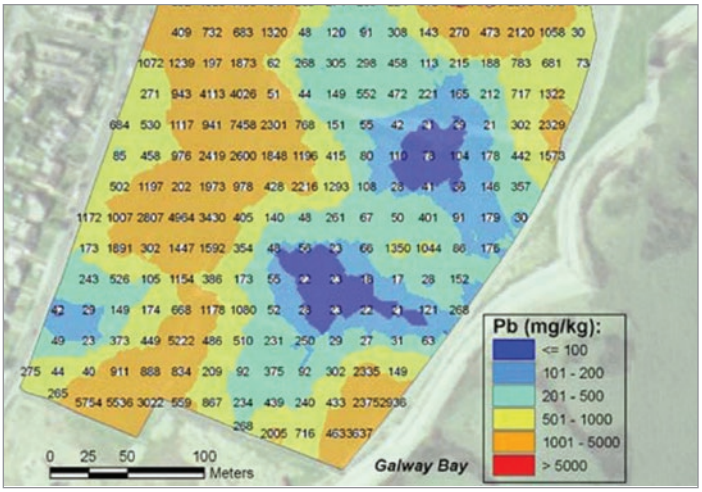
Positive/ Negative Results on Screen

Instant Metal Mapping

The DELTA is ideal for measuring priority pollutants Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Se, Tl, Zn, and RCRA Metals Ag, As, Ba, Cd, Cr, Hg, Pb, and Se.

The big picture is seen with GPS-XRF metal-concentration contour mapping. The unique DELTA Xplorer Option wirelessly integrates GPS coordinates with the DELTA XRF results. Coupled with a measurement control Field Soil stick, the DELTA XRF is a very cost-effective tool available for large sites, and enables large, inexpensive data sets to be generated very quickly.

The full power of the DELTA series is unleashed with the DELTA 50 kV unit for the ultimate in speed, sensitivity and low limits of detection for challenging elements such as Ag, Cd, Sn, Ba, and Sb.

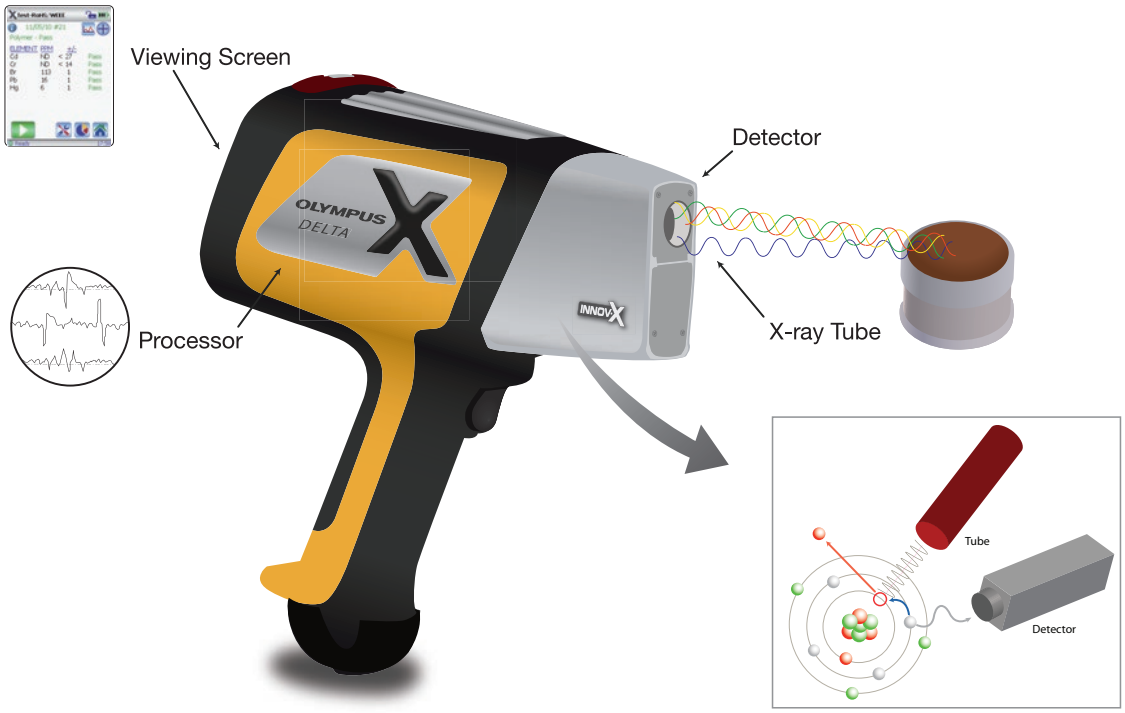


A GPS-XRF Concentration Contour Map delineating Pb contamination patterns in a 20 m x 20 m sports park.

X-ray Fluorescense Technology for Overall Value

DELTA Handheld XRF Configuration

The DELTA brings the power and flexibility of handheld X-ray fluorescence spectrometry to the field. Ruggedized and ultra portable, this dramatically fast 24/7 technology provides accelerated testing times, allowing for hundreds more tests to be conducted per day with analytical confidence. The DELTA's real overall value is to help make decisions in real time with minimal reliance on off-site laboratory testing. The DELTA series analyzers are configured with powerful miniature X-ray tubes, Si-PIN detectors or highly advanced Silicon Drift Detectors (SDD), specialized filters, and multi-beam optimization for the ultimate in XRF field analysis.



Powerful X-ray Tubes

The DELTA Environmental Analyzer can be configured with a 40 kV or high-powered 50 kV incident beam. The 40 kV tube provides excellent limits of detection, and analysis capabilities for all contaminant metals. The 50 kV tube allows for lower limits of detection for Cd, Ag, Sb, and Sn, and provides improved analysis of Ba in high titanium matrices.

Optimized Beams

The DELTA provides coverage of all contaminant metals with optimized three-beam kV-filter-current settings. Beam 1 unleashes its full power of performance by detecting challenging metals such as Ag, Cd, Sn, Ba, and Sb. Beam 2 provides rapid and full screening of primary pollutants. Beam 3 focuses in on the following light elements: S, Cl, Ti, and Cr. Beam settings are all selectable and programmable.

Superior Detection

The DELTA incorporates Si-PIN detectors for screening and analysis, or advanced Silicon Drift Detectors (SDD) for optimum resolution, count rate, and speed available in handheld XRF.

DELTA Environmental Metals Limits of Detection

Elements	40kV Si-PIN	40kV SDD	50kV SDD
Ag	20-30	6-8	3-5
As	4-8	1-4	1-4
Ba	40-60	10-20	20-25
Cd	20-30	6-8	2-3
Cr	10-30	5-10	5-10
Cu	15-30	5-7	5-7
Hg	10-15	2-4	2-4
Ni	20-40	10-20	10-20
Pb	5-10	1-4	1-4
Sb	30-40	12-15	5-7
Se	4-8	1-3	1-3
Sn	30-40	11-15	5-8
Ti	10-15	2-4	2-4
Zn	10-15	2-4	2-4

Note: Concentrations are in PPM Ta/Au tube target; Clean SiO_2 matrix; 120 secs

The DELTA Series

Everything You Need in Handheld XRF with State-of-the-Art Innovation

The New Generation DELTA Handheld XRF Analyzers are ergonomically advanced with a forward looking design incorporating the latest in electronics, components, and software technology.

DELTA Professional

The DELTA Professional with a 40kV tube and SDD detector is the best value solution from Olympus for handheld XRF analyzers. It provides superior performance in speed, LODs, and elemental range.

DELTA Premium

The DELTA Premium with advanced 40kV tube and large area SDD detector is best for ultra quick, analytically demanding applications, such as trace levels and light elements in low alloy steel, soil, mining, and metallurgical samples.

DELTA Classic Plus

The DELTA Classic Plus with a 40kV tube and Si-PIN detector is ideal for simple applications. It provides quick ID, screening, sorting, and elemental and metals analysis.

Some DELTA Premium models can be configured with a 50kV tube to optimize LODs for high-Z and challenging elements, such as Ag, Cd, Sn, Ba, Cr, Sb, Te, and Rare Earth Elements (REEs).

The newly available DELTA X-act Count Technology can provide even better sensitivity and precision in faster time for more materials than before. Throughput is increased with the same or better precision in half the time for most elements.

Features and Benefits
Powerful 4W X-ray tube, 200 µA current (max), optimized beam settings
Tight geometry for exceptional LODs and high analysis throughput
Large-Area SDD and customized X-ray tube options for exceptional sensitivity and precision for more elements and materials
Patent-pending automatic barometric pressure correction that adjusts calibration as needed for more accurate analysis of light element.
Lightning-fast data acquisition for faster testing time
Floating Point Processor: Provides more calculations in less time, and leverages more advanced calibration algorithms
Integrated Bluetooth® for data input and output available in most countries
Integrated wide area heat sinks throughout the DELTA body for high power use in extreme temperatures
Analysis indicator lights visible from 360° to help ensure safe use
Advanced colortouch LCD screen for clarity, brightness, responsiveness, and energy efficiency for indoor/outdoor use
Accelerometer technology puts the unit into sleep mode to save energy when not in use; logs impacts for tool management
DELTA PC Software for enhanced data analysis, calibration modeling, and optional closed beam workstation operation
USB interface port for high-speed downloads and seamless PC control
Ergonomic rubberized handle for enhanced grip
Docking Station and Hot Swap Batteries

The unique DELTA Docking Station frees you from having to power down the analyzer. The station charges the analyzer battery and a spare, and performs periodic calibration checks. DELTAs can be operated 24/7 in the field with hot swap battery replacement.

DELTA Field Accessories

A variety of accessories and options are available to take full advantage of the DELTA Handheld XRF in the field. From portable bench-top setups for prepped samples to XRF-GPS-GIS setups for full-scale, large area, in-situ instant metal mapping, these accessories help maximize efficiency of field XRF testing.

DELTA accessories and options on this page are optional and can be coupled with an initial purchase or at any time after.

1. DELTA Portable Workstation

Portable workstation with integrated safety-lock shielding is convenient for bagged, prepped, filters, dust wipes and liquid samples or for multiple small objects; a PC is connected for remote control of this closed-beam DELTA set-up.

2. DELTA Holster

The holster keeps the DELTA by your side and within easy reach.

3. DELTA Soil Foot

The soil foot provides hands-free analysis with the DELTA for long testing times.

4. DELTA 50kV Safety Shield

The safety shield provides additional shielding from open beam radiation for field use of the full 50kV power.

5. DELTA Xplorer

The Delta XRF-GPS-GIS Xplorer Configuration provides seamless connectivity between XRF and GIS for rapid targeting and real time decision making.

6. DELTA Soil Stick

The soil stick minimizes wear and tear on your back and knees and provides push button operation of the DELTA from an adjustable height. It's most applicable for in-situ testing on large scale soil geochemistry and environmental programs

The DELTA Line

The DELTA series handheld XRF analyzers are configured with powerful miniature X-ray tubes, Si-PIN, or highly advanced Silicon Drift Detector (SDD) detection, specialized filters, and multi-beam optimization for the ultimate in XRF field analysis.

DELTA Specifications*

	DELTA Premium	DELTA Professional	DELTA Classic Plus
Excitation Source	4W Rh, Au, or Ta anode (per application) X-ray tube	4W Ag, Rh, Au, or Ta anode (per application) X-ray tube	4W Au or Ta anode X-ray tube
Detector	Large-Area Silicon Drift Detector	Silicon Drift Detector	Si-PIN Diode Detector
Analytical Range	Alloy and Mining: Mg and up for Rh/Ag and Al and up for Ta/Au; Soil: P and higher		Alloy and Mining: Ti and higher; Soil: P and higher
Weight	1.5 kg (3.25 lbs) without battery		
Dimensions	260 × 240 × 90 mm (10.25 × 9.5 × 3.5 in.)		
Environmental Temp Range	-10 ºC to 50 ºC (14 ºF to 122 ºF)		
Processing Electronics	530 MHz CPU with integrated FPU with 128 MB RAM; Proprietary Olympus Digital Pulse Processor (DPP)		
Smart Electronics	Accelerometer; Barometer for atmosphere pressure correction of light elements' measurements		
Power	Rechargeable Li-ion battery; Hot-swap maintains analyzer power during battery charge		
Data Display	32 bit Color QVGA resolution, Blanview transmissive backlit touchscreen; 57 × 73 mm (2.25 × 2.9 in.)		
Data Storage	1 GB microSD (stores ~75,000 readings)		
Data Transfer	USB, Bluetooth®		

Standard Accessories

- Waterproof Carrying Case
- Two (2) Li-ion Batteries
- Electronic User Manual and User Interface Guide and Printed Quick Start Guide
- Docking Station
- Mini USB Cable
- 316 Stainless Steel Calibration Check Reference Coin
- Ten (10) Spare Windows
- Integrated Wrist Strap
- DELTA PC Software
- Factory Authorized Training and Support

OLYMPUS SCIENTIFIC SOLUTIONS AMERICAS CORP. is certified to ISO 9001, ISO 14001, and OHSAS 18001.

*All specifications are subject to change without notice.

www.olympus-ims.com

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