

# X-5000

## Laboratory XRF with Field Portability



Benchtop Power, Performance, and Safety Combined with Portability, Speed, Ease, and Cost-Effectiveness

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# The X-5000

## Unites Laboratory EDXRF with True Field Portability

The Olympus X-5000™ is engineered to provide safe and superior in-the-field energy dispersive X-ray fluorescence (EDXRF) analysis. Functioning as a portable laboratory, this high-powered instrument is equipped with a secure closed-beam sample chamber and flexible analytical software that features a wide range of factory default and user-defined calibrations. The X-5000 offers the performance and safety of traditional benchtop EDXRF, merged with the cost-effective benefits and ruggedness of proven, portable XRF technology.

- Integrated, portable EDXRF analyzer for fast, easy-to-use performance for immediate action in the field, on production lines, or in inspection areas.
- Battery operated and easy to carry, ergonomic design make it a perfect choice for field use.
- Fully integrated PC and industrialized touch screen for user-friendly operation.
- Large, enclosed testing chamber readily handles assorted objects, standard XRF lab cups, liquid sample bottles, and bagged samples.
- Fully interlocked and closed-beam X-ray system provides users the advantages of XRF analysis in a safe portable unit.



# The X-5000 Advantage

## Performance and Power

The X-5000™ offers a high level of performance and power not typically found in field-portable systems.

- A 50 kV/10 W X-ray tube delivers extraordinary in-the-field limits of detection (LOD's) from Mg through to U.
- Multiple anode configurations available including:
  - **Tantalum** (Ta) anode configuration is utilized for excellent sensitivity when measuring over 25 heavy metals (such as Cd, Ba, Ag, Au, Pb, Sn, Sb), in addition to many rare earth elements (including La, Ce, Pr, Nd, Sm)
  - **Rhodium** (Rh) anode configuration is available for optimized analysis of light elements—such as Mg and Al, in addition to mid-range transition metals.
  - **Silver** (Ag) anode configuration is available for enhanced detection limits of light elements in petroleum applications.
- Innovative large-area silicon drift detector (SDD) provides high precision measurement of a wide array of elements.
- Six-position primary beam filters allow for optimal performance across the periodic table.
- Outstanding performance for light elements without vacuum or helium purge.

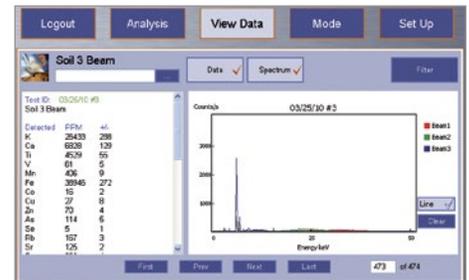
An on-board PC offers full operation of the X-5000 in any environment.

- Large display with a virtual keyboard.
- Industrial grade color touch screen.
- User-friendly interface allows for:
  - Spectral overlay
  - Easy peak identification
- Multiple algorithm options are available, including fundamental parameters, Compton normalization, empirical calibration models, and spectral matching.



## Portability

Weighing only 11.5 kg, the X-5000 can be taken virtually anywhere testing is needed, from the lab to the field and beyond. This self-contained, closed-beam unit provides the ultimate in user safety.



### Take It Anywhere

Use it around the work site, at the inspection station, on the production line, or on the lab bench. Optional three-hour Li-ion battery pack provides true field use capability.

### Start Testing Immediately

Open the cover and place the material on the window, and then close the cover and start testing. Features an interlocked, closed-beam operation.

### Get Results

Results are displayed on the industrial-grade touch screen within seconds. Data is stored automatically in a tamper-proof format. Print material test reports (MTR), or RoHS certification of compliance (CoC) directly from analyzer through a USB connection to a printer.

# X-5000 Application Range

## Elemental Analysis in Petrochemical Fluids and Hydrocarbons

The X-5000™ analyzer provides accurate determination of trace to percent levels of elements in fuels, oils, and lubricants. This powerful, field-portable analytical instrument is used in a wide variety of industries to identify elements and determine the actual elemental concentrations present in a variety of matrices (solid, powdered, and liquid samples). Simply collect and analyze—no sample preparation is required.

Key applications include:

- ASTM D4294 (sulfur analysis).
- ASTM D6481 (unused lubricating oils):
  - Ca, P, Zn, S;
  - Monitoring of Mo, Ba, Mn.
- Monitoring of wear metals:
  - Fe, V, Pb, Cr, Cu, Sb, Sn, Mo, Ti, Ni, Cd.
- Heavy fuel oil analysis aboard vessels:
  - Sulfur content in SO<sub>x</sub> Emission Control Areas (SECAs).
- Diagnosis of abnormal wear through analysis of wear debris and particulates.
- Mercury and arsenic contamination in tank-bottom sludge.



## Mining and Geochemistry

The X-5000 is ideal for exploration and mining samples including soils, sediments, rock chips, bagged drill cuttings, cut core, and liquid analysis of highly acidic samples. The X-5000 delivers excellent precision and accuracy for critical measurements, as well as the low LODs required for specialized applications, such as:

- Precious metals.
- Rare earth elements.
- Gold and gold pathfinders.
- Cassiterite, cadmium, and antimony.

Field analysis of light elements—such as Mg, Al, Si, P, S and Cl—is achieved without vacuum or helium purge. With its portable design and minimal requirements for sample prep, the X-5000 meets the standards of the mining and geochemical industries.



## Environmental Analysis

The X-5000™ is ideal for field-portable XRF analysis of soil and sediment analytes, in bagged or fully prepared samples, to help comply with EPA Method 6200. In addition to commonly regulated analytes, some desired light elements, such as Mg, S, and P, can also be detected.

The X-5000 delivers superior LOD, rapid analysis time, and analytical confidence during screening or qualitative, semiquantitative, or quantitative analysis, enabling you to simultaneously analyze up to 25 elements within seconds. The eight RCRA and priority pollutant metals are easily and quickly measured on-site in soil, solids, wet sediment, sludge, and liquids using the X-5000. Its compact design and battery-power operation make the X-5000 the analytical choice for field use.

Ensure compliance with global environmental methods:

- US EPA 6200 and ISO/DIS 13196.
- US EPA TCLP HAZMAT classification.
- US EPA, HUD, NIOSH, and OSHA.
- Priority pollutant metals and eight RCRA metals.



## Alloy Analysis

The X-5000 captures the power, speed, and precision of a dedicated industrial alloy analyzer in a compact and portable unit. The integrated workstation design and interlocked closed-beam system is ideal for incoming inspection, scrap processing, foundries, or on the production line.

Specific applications include:

- Analysis of small samples and turnings.
- Analysis of ID alloys from ultrasmall shavings and particles down to 50  $\mu\text{m}$  or less. Ideal for tracing metal particles for failure analysis.
- Detection of residual, tramp, or poison metals such as, Cd, Sn, Ag, Cu, and other elements <0.01%.
- Screening of alloys to measure for low concentrations of P and S in carbon steels, stainless steels, and other alloys for quality control.



## Consumer Products

The X-5000™ performs quick, easy, nondestructive screening for Pb, Hg, Cd, Br, and other toxic metals used as additives in consumer products. This is particularly important for products that are intended for children. This type of analysis is also performed at border crossing points to ensure the compliance of imported products.

Applicable consumer products include:

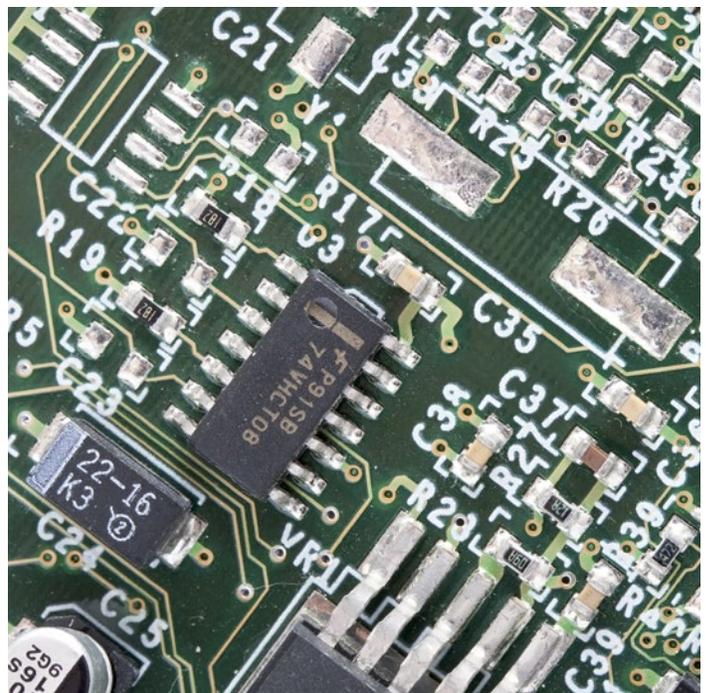
- Toys and sporting goods.
- Furniture and fabric.
- Costume jewelry and apparel.
- Foods and beverages.
- Vitamins and supplements.
- Cosmetics and personal care products.



## RoHS Directives

The X-5000 delivers fast and simple RoHS compliance results for Cd, Pb, Hg, total Cr, and Br. The patent-pending RoHS Engine Method automatically optimizes the X-ray source and filtering for optimal detection limits of alloy and polymer samples. Production-friendly, nondestructive analysis is used to detect ppm levels of restricted substances. This is ideal for meeting requirements such as the RoHS Packaging Directive, ELV Requirements, as well as various customer specifications, which are often more stringent than RoHS limits. The analyzer's large sample chamber is also ideal for a variety of sample types, including:

- Cables.
- Connectors.
- PCBs.
- Metal components.
- Solders.



## Flexible Configuration

Sophisticated factory-default calibrations enable you to analyze a wide variety of samples using turnkey settings. For applications with no commercially available standards or with proprietary standards, the X-5000™ allows you to adjust the calibrations based on your own unique standards for control over elemental correlation.



## Specifications\*

<b>Excitation Source</b>	10 W X-ray tube. 50 kV, 200 $\mu$ A X-ray tube
<b>Application-Optimized X-Ray Tube Anode</b>	Rhodium anode for light-element-focused applications Tantalum anode for heavy-transition metal-focused applications Silver anode for petroleum and oil-focused applications
<b>High-Resolution Silicon Drift Detector</b>	
<b>Resolution</b>	<165 eV (FWHM Mn K-alpha line)
<b>Powerful Pentium Processor, Embedded XP</b>	
<b>Sealed, Field-Hardened Color Touch Screen</b>	20.9 cm $\times$ 15.9 cm (8.25 in. $\times$ 6.13 in.)
<b>Safety Interlocks that Ensure a Closed-Beam System</b>	
<b>Multiple Analysis Modes Include:</b>	Fundamental parameters Compton normalization Empirical calibration models Spectral matching
<b>Six-Position Primary Beam Filters for Optimal Performance across the Periodic Table</b>	
<b>A Rugged, Injection-Molded, Sealed Carrying Case and Sealed Test Platform</b>	
<b>Large Sample Platform with an Interlocked Testing Cover</b>	
<b>Heavy-Duty Carrying Case with Wheels and Telescoping Handle</b>	
<b>AC Power Adaptor</b>	110–220 VAC, 50–60 Hz, 70 W max
<b>Optional 3-hour Li-ion Battery Pack</b>	Necessary for true field portable use
<b>Operating Environment Temperature</b>	10 $^{\circ}$ C to 50 $^{\circ}$ C
<b>Humidity</b>	10% to 90% relative humidity, noncondensing
<b>Total Weight</b>	11.5 kg (25 lb)
<b>Instrument Dimensions</b>	38 cm $\times$ 33 cm $\times$ 28 cm (15 in. $\times$ 13 in. $\times$ 11 in.)
<b>Sample-Chamber Dimensions</b>	29 cm $\times$ 15 cm $\times$ 11 cm (11 in. $\times$ 6 in. $\times$ 5 in.)

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

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