

# X-50 Mobile XRF



## Specifications:

- 50kV, 200µA x-ray tube for up to 25X power over a handheld instrument
- High resolution Si PIN diode detector that delivers < 190 eV resolution (FWHM Mn K-alpha line) in a proven, field-rugged package
- Rugged, injection molded, sealed carrying case and sealed test platform
- Powerful Pentium processor, embedded XP and sealed, field-hardened color touchscreen
- Multiple analysis modes including Fundamental Parameters, Compton Normalization, Empirical Calibration models, Spectral Matching
- 6-position primary beam filters for optimal performance across the periodic table
- Sample platform with interlocked testing cover
- AC Power or 3 hours Li-ion battery power with optional battery pack (typical duty cycles)
- Total weight 20 lbs/9 kg
- Dimensions (approx.) 12" x 13" x 8" in./ 30 x 33 x 20 cm
- Sample chamber dimensions 12" x 8" x 5" / 30 x 20 x 12.5 cm

## Worldwide Operations

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# X-50 Mobile XRF

The World's First XRF Featuring  
the Performance of a Benchtop  
and True Portability



Performance • Portability • Safety

**INNOV-X SYSTEMS**

Contact Innov-X today for a free demonstration.  
Check out our video demos at [www.innovxsys.com/X50demos](http://www.innovxsys.com/X50demos)  
Ask about our rental programs. E-mail: [rentals@innovxsys.com](mailto:rentals@innovxsys.com)

**INNOV-X SYSTEMS**

# THE XRF REVOLUTION CONTINUES WITH THE X-50 MOBILE XRF

The XRF Revolution continues with the pioneering manufacturer of portable XRF for on-site XRF analysis: the X-50 Mobile XRF. The X-50 uniquely satisfies the rapidly growing demand for benchtop analytical power with easy portability, offering a field-hardened package for on-site analysis in virtually any environment.

The X-50 Mobile XRF offers a higher level of power and performance not possible in smaller handheld XRF's.

Operating at up to 25 times the power of a handheld XRF, the X-50 is an industrial-grade XRF offering the performance of traditional tabletop XRF systems while maintaining Innov-X Systems signature XRF portability.

The X-50 is hardened for in-field use, unlike traditional benchtop XRF. It goes anywhere – it can be operated by battery or AC power. Its onboard factory calibrations make it exceptionally easy to use by non-technical operators. The underlying software includes a full-featured analytical and user calibration package for advanced technical users.

The X-50 has an added degree of safety in portable XRF's. It is a closed-beam system, unlike open-beam handheld XRF's. Under normal operation a sample is placed inside a chamber with an interlocked lid for x-ray operation.

The X-50 is an excellent complement to handheld XRF systems and a powerful mobile alternative to the limitations of traditional bench-top systems.

## X-50 Operation



**Take it anywhere.** Carry to work site, inspection station, production line or stay at the lab bench.



**Starts up immediately.** Open cover and place material on window; close cover; test starts. Features interlocked, closed beam operation.



**Get Results!** In seconds results are displayed on industrial-grade touchscreen display.



**Document.** Data stored automatically in tamperproof format. Print material test reports (MTRs) or RoHS Certificates of Compliance (CoCs) on the spot.



# X-50 XRF APPLICATIONS

Each **Innov-X X-50 Mobile** is outfitted with a software and factory calibration package optimized specifically for its intended use – RoHS, Environmental, Mining, Alloy, Oil Analysis and more. Additional packages may be added anytime.

Need custom or unique calibrations? The X-50 also features a full empirical package. Operators may develop their own calibration models for 25 or more elements, fit curves, customize background corrections, and more.



## RoHS

The X-50 delivers fast & simple RoHS compliance results for Cd, Pb, Hg, total Cr and Br. Detection limits are superior to handheld XRF, with substantial improvement for Cr and Cd. Features and advantages include:

- Large chamber for a variety of sample analysis: cables, connectors, PCBs, metal components, solders
- RoHS-Engine (patent pending) method to automatically optimize x-ray source and filtering for optimal detection limits – no operator input required!
- Improved cadmium detection limits over hand held XRF: 1-2 ppm in soils, polymers, low density alloys
- Total Detection: Cd+Cr+Pb+Hg combined LOD < 25 ppm in many sample types
- **Sn-based Solders:** Confirm Cd<80 ppm in Sn-based solders - handheld XRF can't do this

The X-50 is ideal for the RoHS Packaging Directive or ELV requirements where detection limits for Pb, Hg, Cr and Cd are much lower than RoHS compliance levels. Also, the X-50 is ideal if your customers require much lower detection limits than mandated by RoHS. For example some companies have internal requirements of 10-20 ppm threshold levels rather than the 1,000 ppm (100 ppm for Cd) in RoHS Directives.



## Environmental

Whether screening according to EPA Method 6200 or performing quantitative analysis on prepared samples, simultaneously analyze 25 elements in seconds! The X-50 delivers lower detection limits, reduced analysis time, and better analytical confidence.

- Analyze bagged or prepared soil samples in the field or in the lab
- Complies with EPA Method 6200
- Wet sediments no problem! Water resistant housing is up to the task. Software can apply calibration correction for water content to convert to dry-basis concentrations
- Detection limits (depending on matrix) 1-2 ppm Cd, 9-15 ppm Cr, 3-5 ppm As, Pb, Better LODs throughout the periodic table compared to handheld XRF
- Air filters, or wipe tests – superior limits of detection. Complies with NIOSH 7702, OSHA OSHA 1 and OSHA OSHA



## Mining

Looking for power AND portability?

The X-50 is ideal for ores, tailings, concentrates, borings, cores, fragments, slurries, filters & films. The X-50 delivers greatly improved performance - compared to handheld XRF - for many transition metals including Cd, Ag, Sn, Sb, precious metals and rare earths. It yields the power of benchmark performance built for on-the-spot analysis.

- Fast, ergonomically-friendly analysis of cores, bagged or prepped samples
- Designed for liquid analysis including highly acidic samples
- Exploration, precious metals: < 5 ppm LOD for gold (Au).



## Alloy Analysis

The X-50 captures the power, speed, and precision of a dedicated industrial alloy analyzer in a rugged, totally portable unit. It's sealed, ruggedized housing is ideal for at-line operation in foundries, incoming inspection, scrap processing or the production line. The high resolution detector and advanced analysis yield fast, precise results even on challenging superalloys, precious metals, and for small metallic particles. Innovative features of the X-50 include:

- Aerospace, Power Generation: Analyze superalloys quickly and precisely. For example Ni/Co superalloys that differ only by Hf concentrations, or 97-3 from Ta, and many more.
- Failure Analysis: ID alloys from ultra-small shavings and particles, down to 50 uM or less. Ideal for tracing wear metals
- Precious metals like 97/3 Au/Pt, Ir
- Catalysts – PMGs, rare earths
- Detect tramp or poison metals such as Cd, Sn, Ag, Cu, others typically down to 0.01%



## Oil, Fuels & Liquids Analysis

Innov-X, with our Joint Venture partner A.P. Moller-Maersk, are outfitting the marine industry with on-board XRF analyzers designed to Maersk's exacting requirements. For non-marine applications, that expertise is available in the X-50 for a variety of elemental analysis for oils, additives, fuels and liquids. Applications include:

- Wear metals in oils for early detection of potential component failures
- Liquids: Analyze ppm level metals in water, organics and fluids. For dedicated liquids analysis, a unique side-samples approach is an option, to eliminate unlikely event of spillage into the analyzer
- Sulfur in fuels and oils for regulatory compliance
- Elemental analysis of fuels, liquids, water for S, Cl, heavy metals, and more



## Other Applications

- Forensics
- Catalysts
- Powders
- General Materials Analysis

The power of the X-50 resides in the variety of calibrations, ease of adding new elements for analysis, spectral viewing, and ease of use. Many applications require analysis where few if any known concentration standards exist for instrument calibration. Or in many cases, standards are proprietary to the customer. In these cases, the X-50 offers a variety of user-calibration methods, peak fitting and background subtraction:

- User chooses from simple spectral acquisition, peak ID, to displayed intensities, and calibration curve fitting
- Add elements any time
- Inter-element effects: Fundamental Parameters, Compton Normalization, Empirical
- Calibration methods named, saved, and easily recalled later

# X-50 OR HANDHELD XRF YOU CHOOSE!

Limits of Detection (LODs) for some common applications of Mobile X-50.

Please Contact Innov-X Systems for specific application questions.

Note: These detection limits are achieved for testing times between 2 and 5 minutes depending on element and sample type.

Application	X-50 LOD (ppm)
<b>RoHS Polymer or Plastic</b> (Non PVC)	1 5-10 2 2 2
Cd Cr Pb Hg Br	
<b>PVC</b> (40% or more Cl)	1 15 7 7 6
Cd Cr Pb Hg Br	
<b>RoHS Packaging Directive</b> Sum Cd + Cr + Pb + Hg	< 20
<b>EPA RCRA and Priority Pollutant Metals,</b> (Soil Ranging from SiO2 to 3-5% Fe content), <b>Many Liquids, Oil or Fuels,</b> <b>Aluminum Alloys</b>	5-10 1-2 1 4-5 4-5 20 3-5 3-5 3-5 3-5 5-8 5-8 5-8
Cr Cd Ag Sn Sb Ba Pb As Hg Tl Se Cu Ni Zn	
<b>Sn-based Solders (RoHS)</b> Cd	<80
<b>Precious Metals Exploration and Mining</b> Gold (Au) in soil, sediment Silver (Ag) in soil, sediment Platinum Metals Group 1: Pd, Rh, Ru Platinum Metals Group 2: Pt, Ir, Os	3-5 1-2 1-2 3-5
<b>Some Rare Earth Elements</b> (non alloys only) La, Ce, Pr, Nd	15-25

**Innov-X offers the highest performing,** most portable handheld XRF in the world.

When you simply must take the analyzer to the sample, there's no better choice than an Innov-X Handheld XRF.

For some applications, customers need both mobility and higher performance than handheld XRF. Or they prefer a closed beam x-ray system for maximum safety. In these cases, the X-50 provides the ideal solution to demands for high performance and portability.

How does the X-50 compare to high-performance handheld XRF? **The X-50 offers lower LODs throughout the periodic table with dramatic improvement (3 to 10 times lower LODs depending upon element) for many key elements.** Check out the Mobile X-50 LOD Table to see for yourself.



## Handheld XRF Analyzers

Innov-X manufactures the leading handheld XRF for analysis of alloys, RoHS compliance, environmental applications and many general materials analysis. It is the most portable, rugged handheld XRF available with nearly 5,000 installed worldwide. It is available with a removable PDA, or for ultra rugged applications, totally sealed internal electronics. The system may be optionally equipped with internal vacuum (Model LZx to include Al, Si, Mg analysis) or an internal camera + collimator for photo-documentation of samples and smaller spot analysis, predominantly for RoHS compliance applications. Both systems run on Windows operating system.

## FOX-IQ Factory Online XRF Analyzers

A complete line of XRF-based process analyzers. Applications include continuous or discrete analysis of alloy tubing, liquid and slurry streams via our patent-pending flow cell technology.

## QXR High Volume Material Sorting Systems

For high throughput, automated sorting, Innov-X offers the conveyor-based QXR sorting systems. These systems operate at 20-100 tons/hour depending on the material, and are designed for continuous, high feed rate material identification and sorting. Applications include:

- Alloys – upgrading stainless, zirconia, copper and other heavies. Also high Cu or Zn aluminum.
- Glass.
- PVC, BFR in polymer streams.
- "Meatball" extraction (diverting copper-bearing materials from ferrous streams).

## Small-spot XRF analysis with Hawk-i

Designed mainly for the Pb-free and RoHS market, the Hawk-i has a small-spot x-ray beam (down to 1 mm in diameter) for elemental analysis of solder joints, small leads or other components where it is critical that the x-ray beam be aligned and striking only the sample region of interest.

# The Innov-X XRF Family



Handheld XRF Analyzers



QXR High Volume Material Sorting



FOX-IQ Factory Online XRF Analyzers



Small Spot XRF With Hawk-i



SEA-Mate™ Oils, fuels and lubricants

