



Handheld X-ray Fluorescence Spectrometer



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Basic components of the instrument



Product Overview

This device offers excellent portability, high detection accuracy, a scientifically sound system design, safety and reliability, and a robust configuration of high-performance hardware and software. It is widely applicable to the analysis of soil heavy metals, RoHS compliance, alloys, coatings, rare earth elements, ores, and precious metals.

1. Product Positioning: High-end handheld XRF applications

2. Key Product Highlights:

(1) Portability: 1.5 kg;

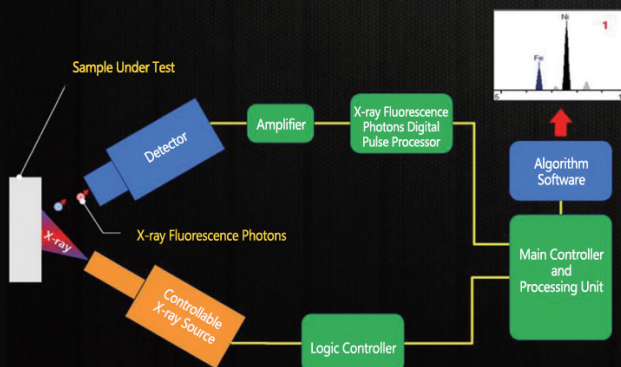
(2) Configuration: Advanced hardware/software and operating system, 8-position filter wheel, dual-camera system, hot-swappable battery, remote control capabilities, etc.;

(3) Performance: Excellent repeatability and stability;

Basic Working principle

Term – X-ray source: A device that generates X-rays;

Term – Detector: A device used in XRF to capture X-ray



When a beam of X-rays strikes the test object, the outer-shell electrons of atoms meeting specific excitation conditions are excited, generating characteristic fluorescence unique to those atoms. The fluorescence intensity is linearly related to the element's concentration. The fluorescence photons are captured by a detector and undergo a series of electronic processing steps to form a spectrum, from which the fluorescence intensity and material concentration are calculated.

Advantage in Composite Indicators

The ergonomically designed center of gravity ensures a superior user experience, and the product weighs just **1.5 kg.**

Large-area Metal Heat Dissipation

One-touch Test Start

Non-slip Handle
Handle Battery Level Display

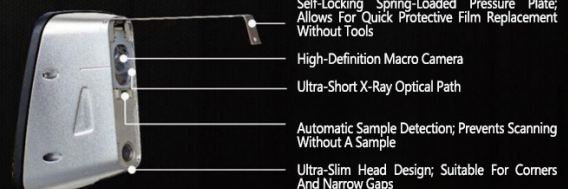
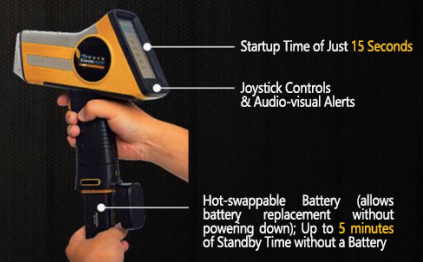
Quad-core 1.8GHz Processor, 2GB RAM, 24GB Data Storage; Powerful Hardware Configuration

High-performance 4096-Channel Digital, Multichannel Pulse Processor

4.5-inch HD Capacitive Touchscreen Display

Tri-color Status Indicator (Breathing Light)

Built-in Wi-Fi and Bluetooth



Technical Specifications

Operating conditions	Temperature: -10°C to 50°C ; humidity: 0–90% RH (20°C); altitude: below 5,000 m.
Dimensions / weight	$276 \times 245 \times 82$ mm; approximately 1.5 kg including battery.
Element range	From Ti to U; from Mg to U (configuration dependent).
Detector	High-performance Si-PIN detector; Fast-SDD detector available as an upgraded option.
X-ray tube	Optional Rh, W or Ag target; tube voltage adjustable from 0–50 kV; tube current adjustable from 0–200 μA .
Processor / storage	Industrial-grade quad-core 1.8 GHz processor; 2 GB RAM; 32 GB storage; capacity for approximately 300,000 spectrum records.
Display / startup	Built-in 4.5-inch high-definition backlit color touchscreen; startup time under 20 seconds.
Operating system	Industrial-grade Linux.
USB	Two USB ports for USB-drive data transfer and PC connection.
Wireless	Built-in Wi-Fi and Bluetooth; connection to PC, Android phone or Bluetooth printer.
Remote control / apps	WinGUI software and Android APP included; remote instrument control and synchronized data sharing via USB or Wi-Fi.
Camera	High-definition sample camera.
Calibration / collimation	Built-in air-pressure correction; optional single or multiple filter combinations; built-in or external calibration options.
Analysis software	Proprietary analysis software can generate professional CSV or PDF reports containing test results, company identification, sample image, operator, date and product description. Report templates and sample names can be customized. One-click testing and customizable test time are supported.
Languages	Simplified Chinese, Traditional Chinese and English as standard; multiple languages can be customized.
Safety	Password protection; infrared sensor at the probe head automatically recognizes samples. X-ray excitation is automatically disabled during an empty measurement. Multi-interface X-ray status warnings are provided.
Battery	Battery has an integrated charge indicator. Approx. 8 hours of operation per battery. Hot-swappable design allows battery replacement without shutting down; battery level is shown on both the handle and screen.
Packaging / environmental tests	Complies with ISTA 3A drop, vibration and impact transport requirements, and GB/T 2423.1 / GB/T 2423.2 high- and low-temperature test standards.
Accessories	Protective instrument case with cushioning. Standard: two 6600 mAh lithium batteries, one charging adapter (110–240 V / 1.2 A input, 12.0 V / 4 A output), one USB-OTG cable, one 32 GB USB drive, five test-window films and one wrist strap. Optional: radiation-protection shield, portable folding stand and shoulder strap.

Parameter Comparison

Model	Standard Version CM-X20H	Upgraded Version CM-X80H
Key Application Areas	1. Alloy analysis (cannot measure aluminum alloys; cannot detect Mg, Al, Si, P, S); 2. Metal coating thickness analysis (cannot detect Mg, Al, Si, P, S); 3. Soil heavy metal detection; 4. Precious metal analysis.	1. Alloy analysis (can measure aluminum alloys; can detect Mg, Al, Si, P, S); 2. Metal coating thickness analysis (can detect Mg, Al, Si, P, S); 3. Soil heavy metal detection; 4. Ore analysis (subdivided into gold-detectable and non-gold-detectable categories); 5. RoHS compliance testing.
Target Customer Base	1. Metallurgy industry (steel mills, steel product plants); 2. Metal product manufacturing and processing industries; 3. Metal resource recycling industry; 4. Gold and silver products industry, pawn industry (precious metal analysis); 5. Environmental protection industry (third-party testing companies, soil remediation companies, environmental public interest litigation, environmental law enforcement, etc.); 6. Manufacturing of products with coatings (electroplating, hardware, bathroom fixtures, automotive, etc.); 7. Electric power industry (testing of coatings and alloy materials; key client: State Grid).	1. Metallurgy industry (steel mills, steel product plants); 2. Metal product manufacturing and processing industries; 3. Gold and silver products industry, pawn industry (precious metal analysis); 4. Environmental protection industry (third-party testing companies, soil remediation companies, environmental public interest litigation, environmental law enforcement, etc.); 5. Manufacturing of products with coatings (electroplating, hardware, bathroom fixtures, automotive, etc.); 6. Electric power industry (testing of coatings and alloy materials; key client: State Grid); 7. Mining industry (geological exploration, mining, ore import/export trade); 8. Manufacturing industry (compliance testing for toxic and hazardous elements in raw materials, semi-finished products, and finished products).
Detector Configuration	Si-PIN	Fast-SDD
Range of Analyzable Elements	Ti~U	Mg~U



Specific Application Areas

Investigation Of
Contaminated Soil Sites

Soil Surveys And
Environmental Assessments

Emergency Testing For
Soil Contamination

Performance Evaluation Of
Soil Remediation Projects

Public Interest Litigation
Regarding The Environment

Solid Waste Testing

Sediment Testing

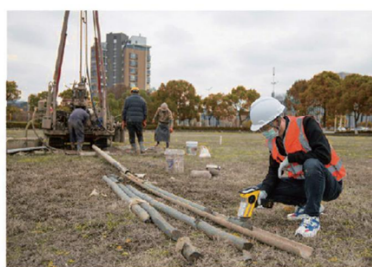
Environmental
Law
Enforcement



Applications for soil heavy metal testing: Suitable for the analysis of inorganic elements in soil environments, sludge, and sediments.

- 1) Contaminated site assessment;
- 2) Soil surveys for agricultural and industrial land;
- 3) Emergency testing for soil heavy metal contamination;
- 4) Emergency testing for heavy metal contamination in industrial wastewater, etc.

Scope of elemental analysis: Suitable for analyzing hazardous heavy metal elements in soil environments, sludge, and sediments. Analyzable elements include: Titanium (Ti), Vanadium (V), Chromium (Cr), Manganese (Mn), Iron (Fe), Cobalt (Co), Nickel (Ni), Copper (Cu), Zinc (Zn), Zirconium (Zr), Niobium (Nb), Molybdenum (Mo), Silver (Ag), Tin (Sn), Tungsten (W), Lead (Pb), Gold (Au), Arsenic (As), Indium (In), Iridium (Ir), Palladium (Pd), Platinum (Pt), Selenium (Se), Yttrium (Y), Uranium (U), and various other elements.



Specific Application Areas



Alloy Grade Identification

Rapid Precious Metal Analysis

Non-Destructive Testing

Analysis Time In Seconds

One-Touch Testing

Alloy Testing Applications: Used in fields such as iron and steel smelting, machinery manufacturing and processing, military equipment manufacturing (including maintenance and decommissioning), aerospace, shipbuilding, automotive manufacturing, metal resource recycling, and precious metal production and processing. It enables rapid, non-destructive analysis of metal material composition.

1) Material Composition Analysis

Rapidly analyzes alloy composition and identifies alloy grades across various manufacturing scenarios;

Iron-based alloys: low- and high-alloy steels, stainless steels, tool steels, chromium/molybdenum steels, etc.;

Cobalt alloys, nickel alloys, nickel/cobalt heat-resistant alloys, titanium alloys, etc.;

Copper alloys, bronze, zinc alloys, tungsten alloys, etc.;

Precious metals: gold, silver, platinum, palladium, etc.

2) Positive Material Identification (PMI)

Used for quality control in manufacturing to inspect raw materials, semi-finished products, and finished goods; enables rapid "pass/fail" determinations to prevent quality risks caused by material mix-ups or substandard raw materials.

3) Metal Recycling and Sorting

Rapidly analyzes and identifies various metal materials—such as iron-, copper-, and aluminum-based alloys and precious metals—during the recycling process, providing data to support valuation for trading and classification for recycling.

Specific Application Areas

Core Samples
Ore Lumps
Ore Fines
Rare Earth
Rapid Soil Testing



Applications for testing rare earths, ores, precious metals, etc.: Suitable for use throughout the entire lifecycle of mineral resource development, enabling rapid on-site elemental analysis.

1) Vein Exploration

Features integrated GPS and BeiDou dual-positioning systems that link test data with geographic coordinates; the acquired coordinate and elevation data can be used to map ore distribution and delineate vein boundaries. During early-stage exploration, rapid analysis of rock fragments, soil, sediments, blast samples, and drill cores helps identify vein trends, reduces reliance on laboratory analysis, and improves exploration efficiency.

2) Mineral Composition Analysis

Ores containing base metals (e.g., manganese, iron, nickel, copper, zinc, gold, silver)
Industrial minerals (e.g., limestone, potassium carbonate, magnesite)
Rare earth ores and mineral sands
Mineral composition in sediments
Ore grade analysis

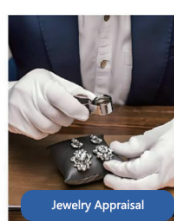
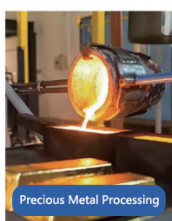
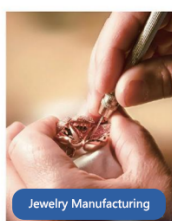
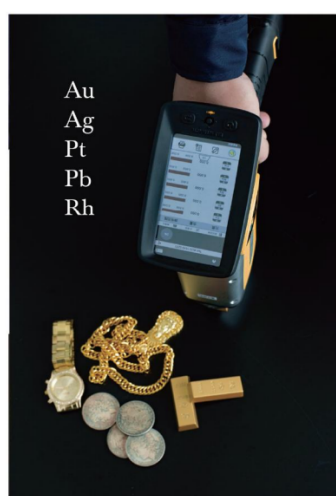
3) Environmental Testing

Detection and analysis of hazardous heavy metals in soil, tailings, dust, and sediments surrounding industrial sites, providing rapid results.

Specific Application Areas



Precious Metal Testing Applications: Precious metals primarily refer to eight metallic elements: gold, silver, and the platinum group metals (ruthenium, rhodium, palladium, osmium, iridium, and platinum). Most of these metals possess beautiful luster and high chemical stability, making them widely used in jewelry making and industrial manufacturing. Precious metal analyzers utilize X-ray fluorescence (XRF) spectroscopy to perform rapid, non-destructive qualitative and quantitative analysis. They are suitable for use across various sectors, including jewelry manufacturing plants, jewelry retail stores, precious metal refineries, quality inspection departments, analytical testing centers, pawn shops, and the precious metal recycling industry.



Specific Application Areas

Fast
Non-destructive
Accurate
Reliable



RoHS Testing Applications: Can be used to screen consumer products—such as toys, textiles, leather goods, and electronic equipment—for lead (Pb), cadmium (Cd), arsenic (As), mercury (Hg), chromium (Cr), and other toxic metals to determine compliance with RoHS regulations.

- 1) RoHS (Restriction of Hazardous Substances Directive) compliance testing: Pb, Hg, Cr, Br, and Cd;
- 2) Lead-free compliance testing for circuit boards, cables, connectors, and solder; compliance testing for toxic and hazardous elements in batteries, paints, fertilizers, and plastics;
- 3) Compliance testing for hazardous elements in automotive seats, leather, fibers, trim, upholstery, etc.;
- 4) Compliance testing for hazardous elements in wood, paper, cardboard, packaging materials, etc.;
- 5) Halogen testing.

Specific Application Areas



Sub-Second Testing Time
Rapid And non-Destructive
One-Touch Testing

Applications for Coating Inspection: This instrument enables accurate measurements without compromising the appearance or integrity of the coating. Utilizing advanced analytical techniques, it delivers rapid results and is suitable for applications involving electronic components, hardware products, fasteners, power system connectors, zinc-nickel alloy coatings, ceramic coatings, decorative coatings, and more.

1) Hardware Industry

Hardware products encompass various metal items manufactured from iron, steel, aluminum, and other metals through physical processes such as forging, rolling, and cutting. Surface treatment methods vary depending on the product's intended function and operating environment.

Protective coatings: e.g., zinc plating;

Protective-decorative coatings: e.g., nickel, chrome, and copper plating;

Functional coatings: e.g., tin plating, silver plating, and hard chrome plating.

2) Fastener Industry

Fasteners are a category of mechanical components used to securely join two or more parts (or structural elements) into a single assembly. Typically manufactured as standardized parts, common fasteners include bolts, studs, screws, and nuts, along with associated components such as washers, retaining rings, pins, and rivets; they are among the most widely used basic mechanical components.

Common surface treatments for these parts include zinc plating, zinc-nickel plating, and Dacromet coating. This instrument can be used to test coating thickness and composition during fastener production and quality inspection.

3) Electric Power Industry

In power system conductive circuits, silver plating is applied to the moving contact points and the stationary contact points of busbars. The thickness of the silver layer directly affects the conductivity, reliability, and operational lifespan of isolating switch contacts. To ensure the silver coating remains effective throughout the specified number of switching operations, relevant standards dictate minimum thickness requirements: no less than 8 μm for moving contacts in indoor conductive circuits, no less than 20 μm for moving contacts in outdoor conductive circuits, and no less than 8 μm for stationary busbar contacts. This instrument is suitable for measuring coating thickness on various power system contact terminals.

4) Electroless Nickel Plating
Electroless nickel plating is a process that utilizes an electroless nickel plating solution to deposit a Ni-P alloy coating onto a part with a catalytic surface via a redox reaction, without the use of an external electric current. This process is characterized by strong corrosion resistance, excellent wear resistance, high gloss, high surface hardness, good uniformity, high process adaptability, and high-temperature resistance. Consequently, it is widely used in industries such as electronics, mechanical machining, mold manufacturing, and the automotive sector.

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