

Skyray Instrument Inc.  
50 Braintree Hill Park, Suite 201,  
Braintree, MA USA 02184  
Tel: 617.202.3879 Fax: 781.519.4766  
Website: [www.skyrayinstrument.com](http://www.skyrayinstrument.com)

# EDX-Pocket-III

Handheld X-ray Fluorescence Spectrometer



**Precision Instruments, Skyray Elaborates**

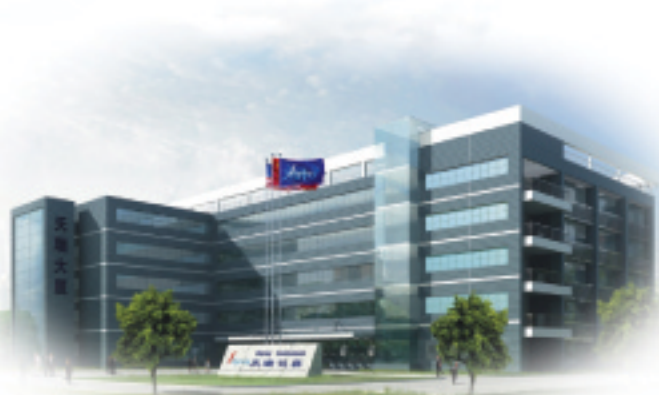


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Skyray Skyray Instrument

## Company Profile



Established in 1992, Skyray Instrument Inc specializes in the development, manufacture, sales and support of X-ray Fluorescence Spectrometers. XRF technology is characterized as rapid, accurate and non-destructive. XRF analyzers can be used in areas requiring elemental analysis from Na to U, e.g., electronic and electric appliances (RoHS), jewelries and ornaments (precious metals, plating thickness), toy safety (EN71-3), building materials (cement, glass, ceramic), metallurgy (steel, non-ferrous metals), petroleum (trace elements S, Pb, etc), chemistry, geography, commodity inspection, quality control and even human body trace elements analysis. Up to now Skyray has won two World's No.1 titles: No. 1 in Sales Amount and No. 1 in Product Categories.

## EDX-Pocket-III

Handheld X-ray Fluorescence Spectrometer

The 3rd and 4th generation of Handheld X-ray Fluorescence Spectrometers i.e. EDX-Pocket-III and EDX-Pocket-IV are to be put on the market soon. They are improved on basis of the 2nd generation. They have the features of more functions, better accuracy and simpler operation. Their introduction makes on-site elemental analysis practical and feasible.



### EDX-Pocket-III

Handheld X-ray Fluorescence Spectrometer

#### Application Fields:



### EDX-Pocket-III

Handheld X-ray Fluorescence Spectrometer

#### Specifications:

- Working principle: XRF analysis using X-ray fluorescence Spectrometry
- Measurable elements: Ti-Bi
- Detector: advanced electric-cooling Si-PIN semiconductor X-ray detector with high performance and high energy resolution
- Excitation source: mini 40kV/50μA X-ray tube, Ag anode
- Data display: high definition and high resolution PDA (Personal Digital Assistant), Windows CE operating system, Bluetooth communication, personal data handling and e-mail sending.
- Data storage: Large capacity SD card and SD card reader enable the data to store on PC and print out
- Power supply: operating time of two fully-charged Lithium batteries is 8 hours
- Weight: 1.35 kg
- Overall size: 260×25×25mm (L×H×W)
- Ambient environment: temperature -20℃-50℃; humidity <85%
- Safety: both PDA and software operations require passwords. Unauthorized people are not allowed to operate.
- Standard accessories: shock, pressure & water-proof carrying case with padlocks, 110v/220v general-purpose charger, large capacity SD memory card, SD card reader, two 4000mAh Lithium batteries, Lithium battery charger, PDA accessories, lab test stand (optional), etc.

### EDX-Pocket-III

Handheld X-ray Fluorescence Spectrometer

#### Main characteristics:

- The instrument is small, light and portable, providing rapid and non-destructive analysis of the tested samples on the site.
- Figurative interface, flexible software operation, intuitive spectrum display and definite results
- Several working curves are provided in the software, which can even be edited and renewed upon test requirements.
- Optional GPS helps locate the tested sample when mining or surveying in the field.
- SD card with super large capacity is available. There is no limit of data storage.
- Attractive design and comfortable feel when held in hand
- The carrying case has high strength and high sealing capacity, drop and shock proof as well.
- Faster analysis and better accuracy, delivering lab-quality results
- Measurable elements: Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Zr, Nb, Mo, Sn, Hf, Ta, W, Re, Pb, Bi, Se, Sb, Pb, Au and Hg
- Application fields: RoHS screening; full-element analysis; analyzing alloy steel, stainless steel, tool steel, Chrome-Molybdenum Steel, Nickel alloy, Cobalt alloy, Nickel-Cobalt heat-resistant alloy, Titanium alloy, Copper alloy, Bronze, Zinc alloy and Tungsten alloy; Grade identification of light Aluminum and Magnesium alloys by measuring other alloy elements.

## ROHS TESTING

### An Introduction to RoHS/Non-halogen Testing of Electric and Electronic Appliances and Toys

Skyray instrument has been engaged in the research, production and sales of X-ray fluorescence spectrometers since its establishment. Our **EDX Pocket Series Handheld X-ray Fluorescence Spectrometers** have received warm repercussion from the manufacturers of electric and electronic products for RoHS testing. After the enforcement of EU Toy Directive, they have become a powerful weapon of toy safety testing.

#### Applied to:

- Production of electric components and parts
- Third party evaluation of electric spare parts and raw material suppliers
- Testing and verification of packing material
- Testing and identification of hazardous elements in batteries
- Testing of toys, stationeries, children goods and gifts



▲ Toy safety testing



Large-sized articles: tested without barrier or limitation.



Non-destructive test of precious goods: with no damage to the objects.

## EDX Pocket III Application fields

RoHS directive is also called green directive, which covers a wide range of products: electronic, electric, medical, communication, toys, and safety protection equipments. They include not only the whole machine products, but also the related spare parts, raw materials and packing materials.

RoHS directive restricts the amount of Pb, Hg, Cr<sup>6+</sup>, PBB and PBDE contained in the related products to be less than 0.1%(1000ppm) and Cd 0.01%(100ppm). These restriction values are the legislative basis for determining whether the products comply with the directive or not.

According to Non-halogen Standard of International Electrotechnical Commission (IEC 61249-2-21), the maximum amount of Br element in the related products is restricted to 0.09% (900ppm), Cl to 0.09% (900ppm) and Br+Cl to 0.15% (1500ppm) .



Testing standard of substances restricted by RoHS Directive

#### Non-halogen Standard

Hazardous substances	Standards (mg/kg)
Br	900
Cl	900
Br+Cl	1500

Hazardous substances	Standards (mg/kg)
Cd	100
Pb	1000
Hg	1000
Cr <sup>6+</sup>	1000
PBBs	1000
PBDEs	1000



Precision parts: accurate positioning, interference eliminated.

## EDX Pocket III Application fields

### Testing standard of substances restricted by RoHS Directive

Hazardous substances	Standards (mg/kg)
Cd	100
Pb	1000
Hg	1000
Cr <sup>6+</sup>	1000
PBBs	1000
PBDEs	1000

### Non-halogen Standard

Hazardous substances	Standards (mg/kg)
Br	900
Cl	900
Br+Cl	1500

### Restricted substances and their typical uses

Pb	
Solders	
Paints	Pigments and driers
Glass materials	Pb is allowed in fluorescent lamp
Ceramic materials	Pb is allowed in certain electronic ceramic materials
Iron, aluminum & copper materials	A certain amount of Pb is allowed
Plastics	PVC stabilizer and pigments
Batteries	Pb is allowed in acidic batteries for vehicles

Cd	
Plastics	Stabilizer and pigments
Solders	Seldom used
Ceramics	Seldom used
Connectors	Relays and switches
Batteries	Cd is allowed in Ni-Cd batteries
Semiconductors	Optical sensors and solar cell panels

Hg	
Batteries	Prohibited (see battery directive)
Connectors	Relays and sensitive switches
Fluorescent lamps	A certain amount of Hg is allowed

Cr <sup>6+</sup>	
Passivation layers	Commonly used for naked metal surfaces to enhance adhesion of plating layers
Anti-corrosive plating layers	Painting and plating layers
Chrome plating layers	Plating layer of chromium metal is not under control
Plasticizer	Commonly used to plastics plating process but not final products

PBBs & PBDEs	
Plastics	Brominated flame retardants

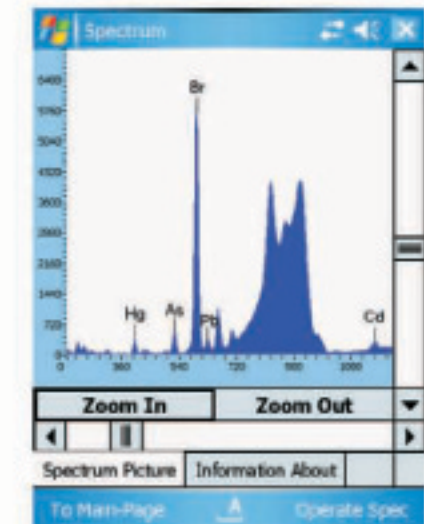
### What are RoHS and WEEE Directives?

The European Union has adopted Directive 2002/95/EC on the restriction of certain hazardous substances (RoHS) and Directive 2002/96/EC on waste electrical and electronic equipment (WEEE) with their publication in the Official Journal of the European Union on February 13, 2003, which stipulates that the producer responsibility principle of WEEE comes into effect on August 13, 2005, and six hazardous substances are restricted to use in new electrical and electronic equipments put on market from July 1, 2006.



## An Introduction to RoHS/Non-halogen Testing of Electric and Electronic Appliances and Toys

### EDX Pocket III Test Example and Analysis



▲ Spectrum of toy test

Element	Intensity	Content
Br	494.715	808
Cd	14.295	140.8
Hg	24.4	25.3
Pb	13.905	107.6
As	34.62	30.9

▲ Results of toy test

Cd in this toy is RoHS incompliant:  
Content of Cd is 140.8ppm > 100ppm  
CBR in this toy is Non-halogen compliant:  
Content of Br is 808ppm < 1500ppm