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Application Advantages for Heavy Metals

- Applied for soil pollution testing caused by mercury, cadmium, lead, arsenic, copper, zinc, nickel, cobalt, and vanadium
- Detecting and mapping pollution areas
- Rapid discovering and solving abnormal conditions
- Rapid tracing of abnormal pollution and effectively searching and circling pollution areas
- Rapid on-site & in-situ testing of heavy metals in soil
- Rapid classifying various kinds of residential lands, commercial lands and industrial lands into 3 levels, named level 1, level 2 and level 3
- Connection of PDA to GIS system for drawing maps
- Equipped with digital multi-channel technology, it operates more rapid qualitative and quantitative analysis. Designed with high statistical counting rate, it greatly improves the stability of the instrument which is much more important for heavy metals testing, because of the low content of heavy metals in soil.
- Outstanding resolution greatly reduces the interference of arsenic and iron to lead and nickel. Its extremely low detection limit perfectly fits to heavy metals detection for environmental protection.

Performance index

Measuring range	Mg to U
Processor and RAM	CPU: 667MHz RAM:256M Maximum expanded storage: 32G Standard configuration: 2G , for storage of large amounts of data.
Analytical range	ppm~99.99%
Testing time	3-30 seconds
GPS、WIFI	Built-in GPS & WIFI system
Battery	Re-chargeable lithium battery, with capacity of 7800mAh, continuously providing 8 working hours ; Equipped with wide voltage (110V-220V) general adapter
Testing object	Solid, liquid , powder
Detector	25mm <sup>2</sup> ,SDD
Detector resolution	Minimum resolution:139eV
Excitation source	Target: Ag High voltage: 5-40kv Tube current: 1-100 μ A
Collimator and filter	Collimator kinds: 2 (4.0 mm and 2.0mm diameter) Filter types: 6 Automatic switch: YES
Video system	CMOS HD camera
Screen	Semi-transmission & semi-reflection LCD touch screen, resolution 640*480
Detection limit	Detection limit: ppm level
Safety	Self-contained password administration
Testing window	Φ 12mm
Gas charging system	Optional Helium charging system
Operational environment	Humidity ≤90% Temperature: -20℃~+50℃
Size	234×306×82mm(L×H×W)
Weight	Net weight:1.6kg Battery : 0.3kg

Outstanding small, light, beautiful, safe, convenient, long standby time, waterproof, precise and rapid

Rapid | Accurate | Non-destructive



# Genius 9000 XRF

## Heavy Metals in Soil Handheld Analyzer



115 countries & regions are using Skyray Instrument up to now

**United Kingdom:**  
**Optech Solutions Ltd.**  
 Riverside Court, Beaufort Park, Chepstow NP16 5UH, UK  
 Tel: +44 (0)1291 418148, Fax: +44 (0)1291 418143  
 Website: [www.optechsolutions.co.uk](http://www.optechsolutions.co.uk)  
 E-mail: [info@optechsolutions.co.uk](mailto:info@optechsolutions.co.uk)

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The ISO 9001:2008 International Quality Certification System Is Implemented



## Genius 9000 XRF

Heavy Metals in Soil Handheld Analyzer



The Genius 9000 XRF is designed to meet the most demanding needs of on-site X-ray analysis in the field. The Genius is small, light and well balanced with a newly designed easier to use user interface featuring more powerful hardware enabling faster testing with increased accuracy and precision than ever before and with quicker and easier access to results. The new hardware configuration including the digital multi-channel technology significantly improve the detection limit, stability and increase its field application.

### Performance Advantage

#### 01 Perfect performance as desktop

The three main core technologies, low power integrated miniature X-ray tube, large area beryllium window electric cooling SDD detector (the best in the world) and the miniature digital signal multi-channel processor significantly reduce testing time and deviation and increase the detection precision to a level of performance similar to the desktop.

#### 02 Small, light and easy to use

Small, light, easy to carry ... perfect for field work. Can carry out on-site and in-situ analysis anytime and anywhere.

#### 03 Fast detection & non-destructive

Only 1-2 seconds is required for rapid detection, however, testing for 10 seconds or more is enough to produce a result of similar precision to a lab. There is no marking or destruction of samples.

#### 04 Light element detection

The Genius can ordinarily detect the light elements starting from Mg without the use of a gas purge. However, the Genius also incorporates a helium gas purge system to further improve detection should it be required.

#### 05 HD camera for more accurate testing

Built-in HD camera as standard enabling easier sample alignment to the exact test point for increased precision.

#### 06 Direct testing

The Genius can test objects directly with no need for sample preparation.

#### 07 Professional, easy to use software

Brand new software interface and core designed for easier quicker operation and access to results. The combination of both FP and EC software means it is more stable and has wider applications fields than ever before.

#### 08 Simple deviation calibration

Built-in intensity calibration methods ensure simple deviation calibration by different sample geometry and inhomogeneous structure density.

#### 09 Faster data transmission

Incorporating a new Embedded Windows CE system, HD touch screen (res. 640x480), digital multi-channel technology and SPI data transmission, the data transmission and processing ability is significantly improved.

#### 10 Last lasting power

Lithium ion batteries with maximum capacity of 7800 mAH can continuously operate for 8 hours. Equipped with a wide voltage AC and 12 V adapter and charger to ensure you can test anywhere anytime.

#### 11 Simultaneous testing of elements

It can detect a large number of elements simultaneously, such as Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Sb, Hg and Pb. More elements can be added according to the customers' requirements.

#### 12 Radiation protection, caring for health

X-rays are automatically switched off within 1-2 seconds when no sample is detected, preventing accidental exposure. With no X-ray leakage when in operation the radiation level is far lower than the international safety standard (can be combined with a desktop test stand with closable lid).

#### 13 Durable design

The instrument is designed to be waterproof and dust-proof and continuously operate under high temperature and humidity. The carry case is manufactured of high strength military grade material which are moisture-proof, shockproof and pressure resistant.

| Accurate | Rapid | Non-destructive |

### Applications in Environmental Protection

The Genius 9000 XRF is designed for in-situ testing and remediation analysis in soil pollution. It is compact, light, well balanced and easy to use. It can be used for many kinds of sample types including slag, rock, soil, mud and waste in the form of a solid, liquid, powder or dust.



### Application Cases:

#### 1. Heavy metals in soil

Simply pull the trigger and within seconds you will know the trace elements present in the soil.

#### 2. Emergency treatment after heavy metal pollution

Can very quickly trace pollution and highlight pollution boundaries on-site.

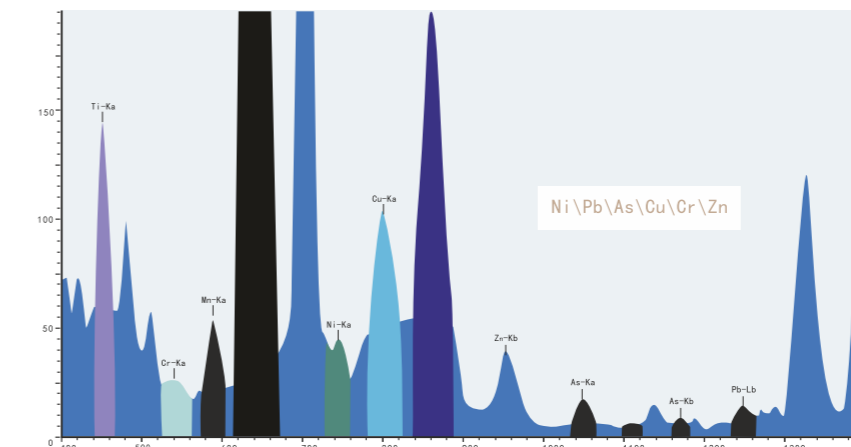
#### 3. Screening of heavy metal polluted samples in large amounts

The Genius 9000 handheld XRF can very quickly and effectively be used to clearly identify key pollution areas for effective management, rapidly distinguishing between polluted and non-polluted areas. It improves the screening and productivity greatly reducing wasted time and the cost of chemical examination and transportation.

### Analytical Precision

Measuring precision of main elements in GBW07425 testing for 30 seconds

Sample	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	As	Se	Sb	Hg	Pb	Cd
07425_1	3811	73	52	566	2.95	10	26	25	63	6	0	1	0	26	0
07425_2	4056	72	54	541	2.95	9	28	18	72	5	0	0	0	28	0
07425_3	3724	68	45	555	2.92	11	28	25	69	8	0	1	0	20	0
07425_4	3980	51	65	602	2.94	12	29	27	70	7	0	0	0	26	0
07425_5	4036	62	51	580	2.95	10	28	29	75	5	0	0	0	27	0
07425_6	4044	75	55	564	2.95	14	25	16	64	5	0	0	0	25	0
07425_7	3794	63	58	575	2.97	14	30	26	70	5	0	0	0	24	0
Average value	3939	65	55	570	3	12	28	24	70	6	0	0	0	25	0
Standard deviation	144	9	7	21	0	2	2	5	4	1	0	0	0	3	0
RSD/%	3.64	13.14	12.28	3.72	0.51	17.71	5.98	22.32	5.19	22.79	0.00	244.95	0.00	11.31	0.00



Spectrum of a sample tested for 30 seconds