

TO BE A WORLD-LEADING ANALYTICAL TESTING SOLUTIONS PROVIDER !

**Core Application Field**

- Measure the content of precious metals in Au, Pt, Pd, Ag and other jewellery.
- Precious metals and jewellery processing industries.
- Jewellery shops, test institutes and assay offices.
- Banks and electro-plating industry.

**Technology specification**

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 manager mode
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 1000 XRF**  
**Handheld Precious Metal Analyzer**



**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)

Test data in this manual, if not noted, is our company's test data.

All information in this manual is for reference only, which is subject to any change without notice.

version number:TRVM 130808 B03

115 Countries & regions are using Skayray Instrument up to now



## Genius 1000 XRF

### Handheld Precious Metal Analyzer



The new generation Genius 1000 XRF Precious Metal Analyser is designed for on-site composition identification. It is small, light and well balanced, safe and waterproof with a long standby time. The Genius features a newly designed easier to use user interface and incorporates more powerful hardware enabling faster testing with increased accuracy and precision than ever before 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 Direct testing

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

#### 06 Easy deviation calibration

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

#### 07 HD camera for more accurate testing

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

#### 08 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.

#### 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 mastering testing data in every environment.

#### 10 Radiation protection, care for health

Triple safety protection function and an automatic sensor automatically switch off X-ray production within 1-2 seconds when no sample is present, preventing accidental exposure. With no X-ray leakage when operating the radiation level is far lower than the international safety standard (can be combined with a desktop test stand with closable lid). Equipped with a light warning system, a green LED lights to indicate the power is on and a flashing red LED when testing to prevent mistaken operation and accidental exposure to X-rays.

#### 11 Last lasting power

Lithium ion batteries with maximum capacity of 7800 mAh can continuously operate for 8 hours, 2 times longer than previous generations. Equipped with a wide voltage ac and 12 V adapter and charger to ensure you can test anywhere anytime.

#### 12 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.

## An Introduction to Precious Metals Analysis

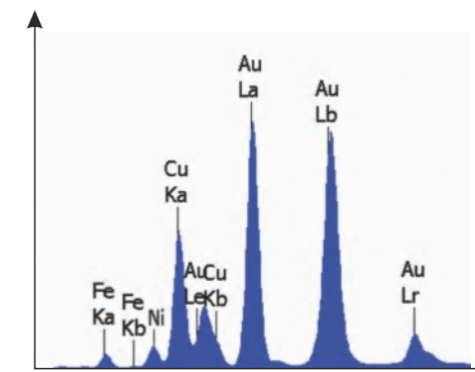
Precious metals refer to the eight elements Au, Ag and Ru, Rh, Pd, Os, Ir, Pt in the Pt family. Most of these metals have beautiful colours and are normally un-reactive as they have a strong resistance to chemicals. They are usually made into jewellery or souvenirs but also have wide industrial applications.

The **Genius 1000 XRF** can test the grade and purity of the precious metals, identify grades of gemstones and conduct more routine physical, compositional and structural analysis of jewellery.

The **Genius 1000 XRF** tests precious metal fineness for gold, silver, platinum, palladium etc. in accordance with the National Standard "GB 11887 Jewellery-Fineness of Precious Metal Alloys and Designation" and "GB/T 18043 Precious Metal Jewellery Content Non-destructive Test Method X-ray Fluorescence Spectrometry".



▲ Jewelry test example



Spectral analysis

Element	Intensity	Content
Au	0.484258	74.492227
Cu	0.196015	15.420389
Ni	0.122583	6.225294
Fe	0.090834	1.902314
Zn	0.080972	1.535448
Ag	0.012456	0.316642

Major constituents of this jewellery are:

Au, Zn, Ni, Ag and Cu; Au content is 74.492%.

Corresponding Jewellery Type

18k gold

Name of the precious metals jewellery	Types of jewellery	Content of metal elements	Type identifier
Au jewellery	18k gold	Au ≥ 750%	18K, G18K, G750, Au750
	Pure gold	Au ≥ 990%	Pure gold, G990, Au990
	Gold999	Au ≥ 999%	Gold999, G999, Au999
Ag jewellery	925 silver	Ag ≥ 925%	S925, Ag925
	pure silver	Ag ≥ 990%	S990, Ag990
Pt jewellery	Pt900	Pt ≥ 900%	Pt900
	Pt950	Pt ≥ 950%	Pt950
	Pt990	Pt ≥ 990%	Pt990
Pd jewellery	Pd950	Pd ≥ 950%	Pd950
	Pd990	Pd ≥ 990%	Pd990

▲ Precious metals jewelries currently sold on the market

Name of the imitation jewelries	Remarks
Gold filled	Gold-filled jewellery is usually composed of a layer of thin gold leaf bonded to metals such as brass, silver, zinc and nickel. Some gold-filled pieces have the look and feel of the gold. Jewellery of this kind are usually stamped 34kf or 18kf.
Gold plating	Gold plating is to deposit a thin layer of gold with thickness typically of about 10 micrometers onto the surface of another base metal, most often copper, silver, zinc, nickel and their alloys, by electroplating. Jewellery of this kind are usually stamped with 18KGP and 24KGP.
Pinchbeck	Pinchbeck is a gold imitation material made by brass, most often plated with gold on the surface.
Rare-earth gold	Rare-earth gold does not contain gold. It is an alloy composed of copper, nickel and a small amount of rare-earth elements.
Ti gold	Ti gold is also an imitation jewellery and is seldom seen on the market. The base metal is usually coated with Ti to form a new material TiN.

Imitation jewellery currently sold on the market.