

TO BE A WORLD-LEADING ANALYTICAL TESTING SOLUTIONS PROVIDER !

Application of Genius 3000 XRF

The Genius 3000 XRF is widely used in screening for hazardous substances, in electrical and electronic goods and RoHS screening and following the the European Union toy statement, the instrument quickly found itself invaluable in the testing of toys. It can be used for quantitative and qualitative testing of electronic components and parts, for third party assessment of electronic components and raw material suppliers, for testing and verifying of packing material, RoHS testing of various kinds of batteries, toys, stationery and children’s products.

Application Advantages for RoHS

- Equipped with the newest SDD with resolution <139 eV it achieves more precise testing of trace hazardous elements.
- The built-in HD camera enables more accurate sample positioning resulting in more precise testing of small articles such as pins.
- Newly designed software provides more effective algorithms and more functions increasing the testing precision of hazardous elements.

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 3000 XRF  
Handheld Hazardous Elements 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.

Skyray Instrument Copyright 2012  
Press date:2012.05.03

The ISO 9001:2008 International Quality Certification System Is Implemented



# Genius 3000 XRF

Handheld Hazardous Elements Analyzer

RoHS WEEE  
CPSIA

The Genius 3000 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. With the built-in HD camera precise sample alignment is easier and more accurate ensuring correct point analysis. 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 Simple deviation calibration

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

### 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.

### 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 time.

### 11 Simultaneous testing of elements

It can detect a large number of elements simultaneously, such 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.



## Application fields

- For RoHS and hazardous elements testing.
- For on-site testing of electronic components and parts.
- For on-site random testing of various kinds of toys, stationery, children's products and gifts.
- For testing and verifying packing material.
- For hazardous substance testing in various kinds of batteries.
- Testing hazardous elements in cloth, shoes and materials.
- Testing hazardous elements in electroplate liquids.
- For hazardous elements in jewellery, ornaments etc.

## Testing Advantages for Applications

### 1. Testing of large articles

Testing of very large articles is just not possible in the common desktop instrument. With the Genius hand held you can test the article directly.

### 2. Testing toys

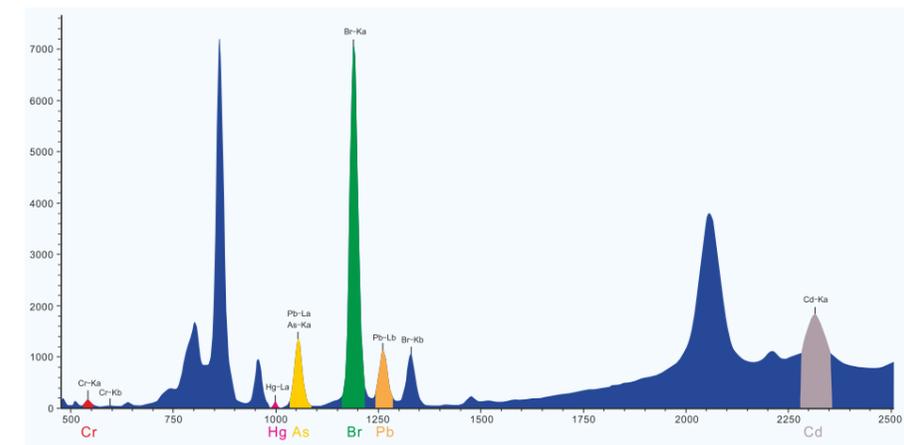
With large numbers of different toys, it is impossible for repeated sampling in labs. With the hand analyser this can be carried out quickly and effectively on-site and therefore reduces the production time.

### 3. Testing of packaging materials

Because of the large sizes and amounts of printing ink, it is not possible for rapid and comprehensive testing with desktops, however, these can be conveniently tested with a hand held device.

## Testing data

Test Result of EC681K



Content Unit	ppm	EC681K					
Number	Working Curve	As	Br	Cd	Cr	Hg	Pb
1	PE	30.5568	775.628	140.4	24.194	103.15	100.973
2	PE	30.4782	770.526	140.08	24.764	100.52	99.2205
3	PE	31.5777	766.347	135.44	24.294	98.674	102.973
4	PE	29.9576	769.997	136.38	25.216	100.2	100.845
5	PE	30.3706	769.872	133.74	24.216	101.08	102.973
6	PE	30.6149	771.922	134.2	23.975	100.79	103.976
7	PE	30.391	771.009	135.32	24.5	100.99	101.487
8	PE	30.3195	768.284	136.61	25.167	99.502	99.5987
9	PE	30.6208	769.656	135.56	24.196	103.65	97.705
10	PE	30.8942	768.275	133.53	24.699	98.026	103.761
True value		29.1	770	137	23.7	98	100
Average value		30.5781	770.152	136.13	24.522	100.66	101.351
Standard Deviation S <sub>n</sub>		0.40532	2.363	2.2759	0.4059	1.6701	1.9819
Triple S <sub>n</sub> Value		1.21595	7.08901	6.8276	1.2178	5.0104	5.94569
Range Rppm		1.62	9.28	6.87	1.24	5.62	6.27
Relative Standard Deviation		1.33%	0.31%	1.67%	1.66%	1.66%	1.96%
Testing Deviation ε (%)		5.08%	0.02%	-0.64%	3.47%	2.71%	1.35%