The XGT-9000 Series is a micro-XRF spectrometer, which provides non-destructive elemental analysis of materials.

**What is the XGT-9000 Series?**

- A micro-XRF spectrometer
- X-ray Analytical Microscope

**Unique key features**

- **Multi-probes** including most advanced 15 µm ultra-high intensity probe
- **Combination of elemental images and transmission images** allows one to detect hidden defects

**Multiple measurement environments for your analysis**

- Whole vacuum
- Partial vacuum
- Whole ambient

**Sample illumination / Observation**

- 5 million pixels, Field of view: 100 mm x 100 mm
- 5 million pixels, Field of view: 2.5 mm x 2.5 mm

**Power**

- Up to 1 mA

**Sample observation**

- Vertical-coaxial X-ray and optical observation
- Fluorescent X-rays and transmission X-rays are placed on the motorized stage.

**Multi-probes can be installed in the instrument and switchable on the software.**

- 15 µm ultra-high intensity probe
- 100 µm probe
- 1.2 mm probe

**Two ultra-high intensity probes of 15 µm**

**Available chamber size**

- 900 mm (W) x 900 mm (D) x 300 mm (H)
- 450 mm (W) x 500 mm (D) x 80 mm (H)
- 1800 mm (W) x 1800 mm (D) x 2400 mm (H)

**Principle**

- Energy dispersive X-ray fluorescence spectroscopy

**XGT-9000 Series X-ray Analytical Microscope**

- Motorized XYZ stage
- Transmission X-ray detector
- NaI (Tl) fluorescent X-ray detector

**What can be analyzed?**

- Single point, multi-points and mapping analyses can be done by one instrument.

**Light elements peak intensity comparison**

**Materials and performance**

- Combination of elemental images and transmission images allows one to detect hidden defects.

**Focus and advanced illumination modes.**

- Surface of the bearing and the corroded zone inside.

**High quality cameras with adjustable focus**

- Clear and flexible optical image observation

**Expansion of Analysis Areas**

- Sample under ambient condition to be measured with enhanced sensitivity.
- He purge module (optional) is placed on the motorized stage.

**Partial vacuum mode allows a better sensitivity for light elements.**

**What are the dimensions?**

- **Dimensions (main unit):**
  - 900 mm (W) x 900 mm (D) x 300 mm (H)
  - 450 mm (W) x 500 mm (D) x 80 mm (H)
  - 1800 mm (W) x 1800 mm (D) x 2400 mm (H)

**Aims and Objectives**

- The XGT-9000 Series provides a wide selection of probe.

**Explore the future**
What is the XGT-9000 Series?
The XGT-9000 Series is a micro-XRF spectrometer, which provides non-destructive elemental analysis of materials.

What is XGT-9000 Pro and XGT-9000 Expert?

XGT-9000 Pro
Excellent sensitivity

XGT-9000 Expert
Ultimate sensitivity & Wide element range

Single point, multi-points and mapping analyses can be done by one instrument.

1. Incident X-ray beam is guided towards a sample placed on the motorized stage.
2. Sample surface can be observed by the optical camera to find an area of interest on the sample.
3. The motorized stage moves to the measurement position once a measurement starts.
4. Fluorescent X-rays and transmission X-rays are detected by individual detectors.

Cu intensity comparison
XGT-9000 Pro vs. HORIBA conventional micro-XRF with a standard detector

Light elements peak intensity comparison
XGT-9000 Expert vs. HORIBA conventional micro-XRF with a light elements detector
Unique key features

Multi-probes including most advanced 15 µm ultra-high intensity

The XGT-9000 Series provides a wide selection of probe. Multi-probes can be installed in the instrument and switchable on the software. Two ultra-high intensity probes of 15 µm and 100 µm can be chosen.

<Multiple probes for the XGT-9000 Series to select>
- 10 µm probe
- 50 µm probe
- 100 µm probe
- 400 µm probe
- 1.2 mm probe
- 15 µm ultra-high intensity probe
- 100 µm ultra-high intensity probe

Clear and flexible optical image

The XGT-9000 Series has high quality cameras with adjustable focus and advanced illumination modes. They provide a clear view of the targeted areas of interest on a sample. The figures on the right show a small bearing with corrosion inside. Clear images can be obtained for both the surface of the bearing and the corroded zone inside.

Simultaneous imaging of fluorescent X-rays and transmission X-rays

Combination of elemental images and transmission images allows one to detect hidden defects.

Multiple measurement environments for your analysis

Multiple measurement environments can be selected depending on the application and the nature of the investigated sample. Whole vacuum mode offers the best sensitivity especially for light elements. Partial vacuum mode allows a sample under ambient condition to be measured with enhanced sensitivity. He purge module (optional) is available.
The XGT-9000 Series: Wide range of applications

Lithium-ion battery: Foreign particle analysis

The XGT-9000 Series can detect and determine the composition of foreign particles, and therefore track the source of contamination. The particle detection function (see page 6) within the XGT-9000 Series makes it possible to count the number of particles, characterize particle sizes, and get the coordinate position of particles to re-analyze them in detail.

Fuel cell: Catalyst loading mass and radical quencher imaging

Proton exchange membrane fuel cell, for example, includes some inorganic elements such as radical quenchers and precious metal catalysts, and the composition and the spatial distribution play important roles in the fuel cell performance. The XGT-9000 Series allows non-destructive composition analysis and elemental distribution imaging on fuel cell materials.

Semiconductor: Coating thickness measurement

The combination of micro-probe and thickness calculation function makes the XGT-9000 Series useful for semiconductor applications such as coating thickness measurement of narrow patterns on a wafer and coating on small electronics. Examples on the right show an optional 4-inch wafer holder and coating thickness measurement result of Au pattern on a Si wafer using calibration curve method.

Electronics: Failure analysis, RoHS testing

Simultaneous imaging of transmission X-rays and fluorescent X-rays is effective to find defects inside electronic components (see page 3). The XGT-9000 Series is also an effective screening tool for RoHS testing. It can perform elemental mapping to find suspicious components on a complex sample and analyze them to obtain the concentration of the regulated elements. The software can display compliance with the RoHS thresholds with a pass/fail result.
Geoscience/Mineralogy: Elemental composition identification

The XGT-9000 Series can be equipped with various probes and spot sizes providing comprehensive and detailed understanding of geological and mineral samples. Chemical phase distribution can be obtained with Labspec Link function (see page 7).

Sample: Thin section of a stone

Forensic: Trace evidence identification, fake product identification

The XGT-9000 Series can be used for identification of trace evidences such as collected gunshot residues, glass fragments, and fibers with sizes even down to tens of micron. It can also be used for fake product identification. This data shows comprehensive and detailed elemental map images of gunshot residue on a cloth with two different probes under partial vacuum condition.

Sample: Thin section of a stone

Biology: Metabolism investigation

Elemental distribution is important to understand metabolism in biological samples. Biological samples contain water or gas and therefore cannot be measured in a whole vacuum because they will be significantly affected or damaged. The unique partial vacuum mode or optional He purge mode with the XGT-9000 Series enables analysis of biological samples without compromising sensitivity to the light elements.

Sample: Fly

Spectrum comparison (He vs Air)

Archaeology: Origin investigation

Non-destructive elemental analysis is important for valuable archaeological samples, and the elemental information helps us determine when and where they were made. Elemental composition of a dragonfly eye bead (shown right) revealed that it originated in Egypt/Middle East during the 2nd century B.C. The XGT-9000 SL Series (super large chamber model) can fit large samples without compromising performance and X-ray safety.

Sample: Dragonfly eye bead
The XGT-9000 Series Software Suite

Simple and rich GUI/Customizable windows/Advanced functions

The user interface offers a flexible way to measure multiple samples or areas in unattended mode (queue function), display the analytical results, present the data, and edit reports. Advanced treatments include image processing, particle detection, co-localized measurement and multivariate analysis (refer to “Combination of XRF and Raman Spectroscopies”).

Particle detection function

The particle detection function is available from optical image, fluorescence X-ray images, and transmission X-ray image. The particle detection function detects particles automatically and marks their position for multi-point measurement, classification and analysis.

Coordinates of detected particles are automatically stored and transferred to the multi-point analysis mode.
The particle detection function is available from optical image, detection, co-localized measurement and multivariate analysis (refer to “Combination of XRF and Raman Spectroscopies”).

The XGT-9000 Series Software Suite classification and analysis. The particle detection function detects particles automatically.

RoHS mode GUI

Floating view

Simple and rich GUI/Customizable windows/Advanced functions

Image processing for mapping

Raw image

Result list view

Processed image

Expand Stack as the Tab

Multiple measurements including mapping / multi points

Dimensions

1

HORIBA XRF family

XGT-9000SL Series

HORIBA XGT-9000SL Series is an X-ray analytical microscope with a super-large chamber which allows a non-destructive analysis of your valuable large samples such as a large printed circuit board, a fuel cell sheet, a brake rotor, wafers, or archaeological samples without compromising user safety.

- Available chamber size: 1030 mm (W) x 950 mm (D) x 500 mm (H)
- Maximum mapping size: 350 mm x 350 mm on a 500 mm x 500 mm sample
- Sample environment: partial vacuum, whole ambient, He purge (optional)

Compact XRF

Sulfur / Chlorine-in-Oil analyzer

In / On-line analyzer

MESA-50** MESA-50K MESA-7220V2 SLFA-60 SLFA-6000 Series**

Real time analyzers for coating thickness or composition

*2 These products are available in all the regions expect the EU and the UK.
The XGT-9000 Series Software Suite

Internal measurements of detected particles are automatically stored and transferred to the multi-point analysis mode. The XGT-9000 Series GUI can mark their position for multi-point measurement, such as fluorescence X-ray images, and transmission X-ray images. Photomultiplier tubes are used for X-ray detection, co-localized measurement and multivariate analysis (refer to "Combination of XRF and Raman Spectroscopies").

View

RoHS mode GUI

Simple and rich GUI/Customizable windows/Advanced functions

Series X-ray Analytical Microscope

Image processing for mapping

Raw image

Result list view

Processed image

Multiple measurements including mapping/multi points

Fe image Particle detection

for mapping

MESA-50* 2 MESA-7220V2 SLFA-60 SLFA-6000 Series* 2MESA-50K

software using LabSpec Link.

Raman Spectroscopy provide more information about a sample.

Co-localized measurements between the XGT-9000 Series and HORIBA XRF and Raman spectroscopies are complementary techniques.

Combination of XRF and Raman Spectroscopies

Large samples such as a large printed circuit board, a fuel cell sheet, a brake...to change without notice.

- Please contact us with enquiries further details on the products in this catalog.
- The color of the actual products may differ from the colors pictured in this catalog due to printing limitations.
- This is strictly forbidden to copy the content of this catalog in part or in full.
- The screen displays shown on products in this catalog have been inserted into the photographs through compositing.

All brand names, product names and service names in this catalog are trademarks or registered trademarks of their respective companies.

https://www.horiba.com/int/

Please read the operation manual before using this product to assure safe and proper handling of the product.