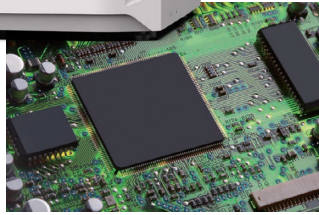
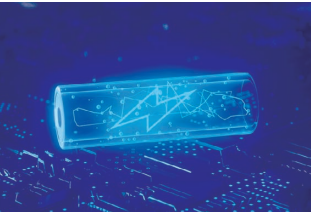
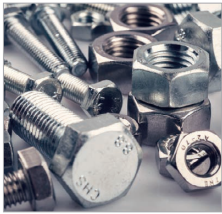


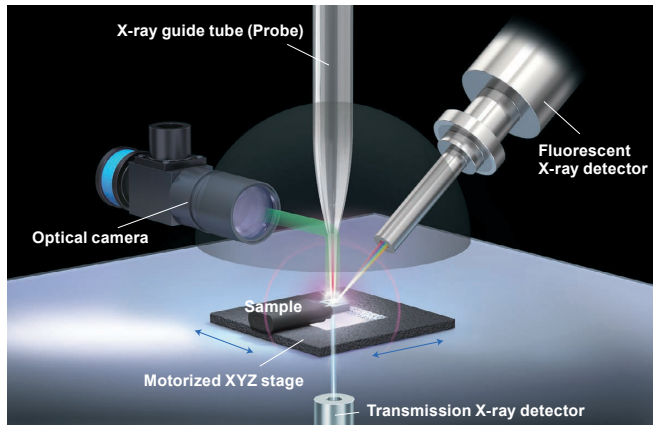
## XGT-9000 Series X-ray Analytical Microscope

*Look Below The Surface*



## What is the XGT-9000 Series?

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



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.

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

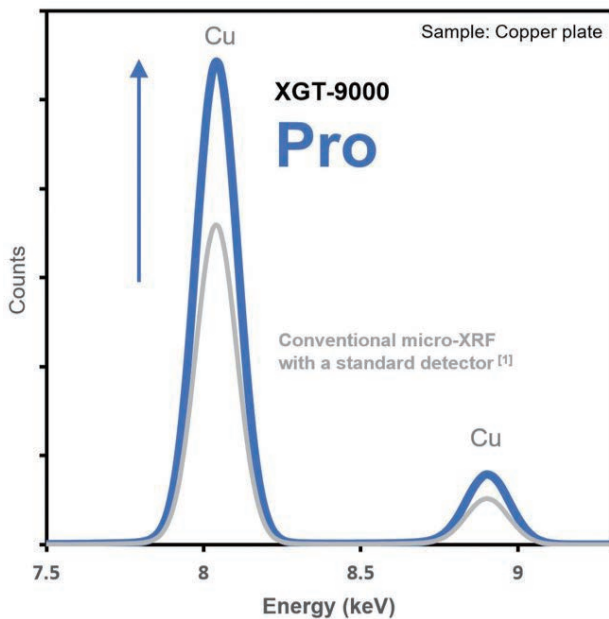
### XGT-9000 Pro

Excellent sensitivity



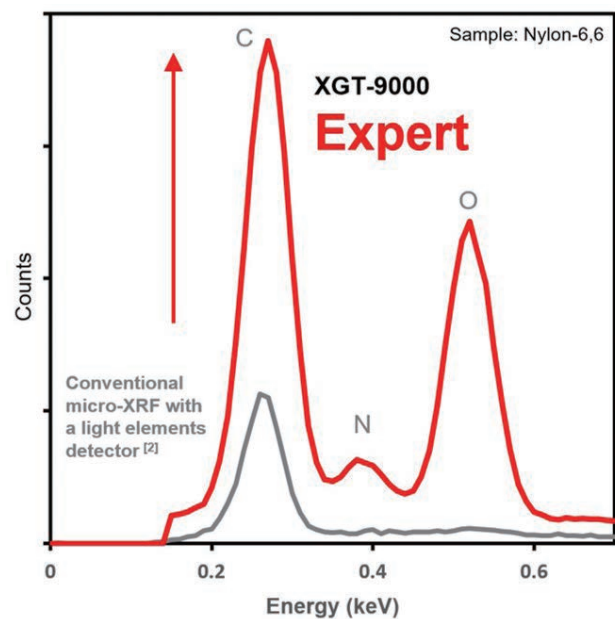
### XGT-9000 Expert

Ultimate sensitivity & Wide element range



**Cu intensity comparison**

XGT-9000 Pro vs. [1]HORIBA conventional micro-XRF with a standard detector



**Light elements peak intensity comparison**

XGT-9000 Expert vs. [2]HORIBA conventional micro-XRF with a light elements detector

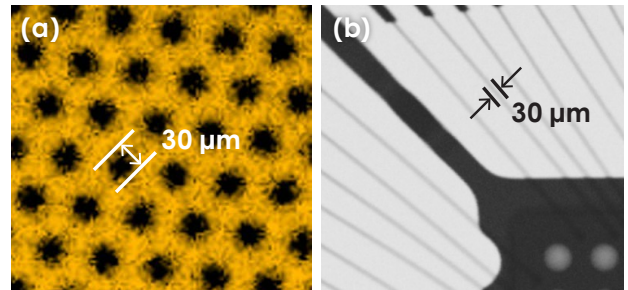
# Unique key features

## 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



**Imaging using 15 μm ultra-high intensity probe**

(a) Cu image on Copper mesh with 30 μm holes  
 (b) Transmission X-ray image of wire patterns inside a IC chip

## Clear and flexible optical image

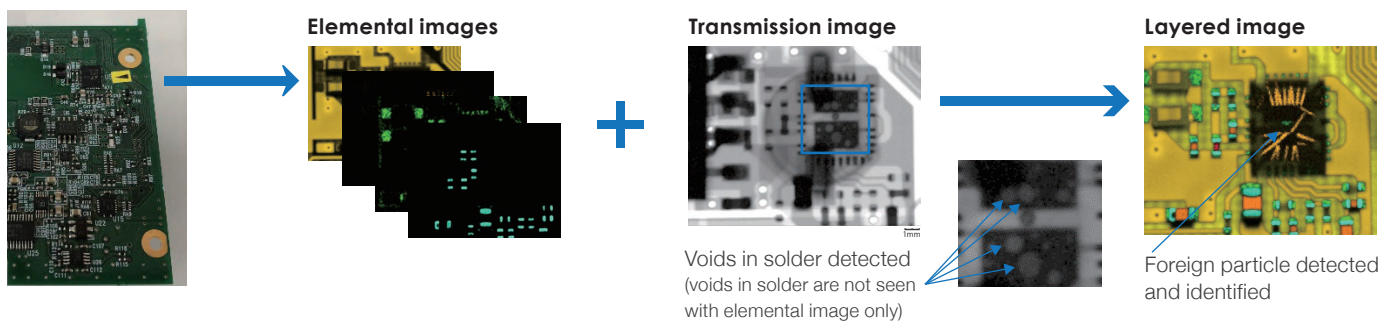
The XGT-9000 Series has high quality cameras with adjustable focus and advanced illumination modes.

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.



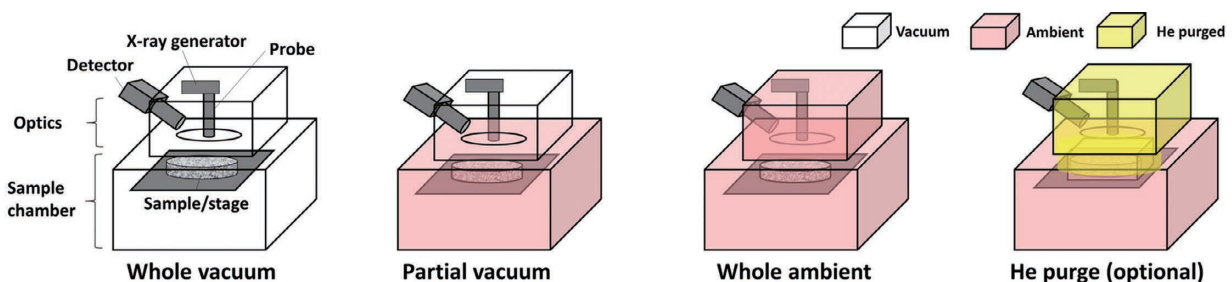
## Simultaneous imaging of fluorescent X-rays and transmission X-rays

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.

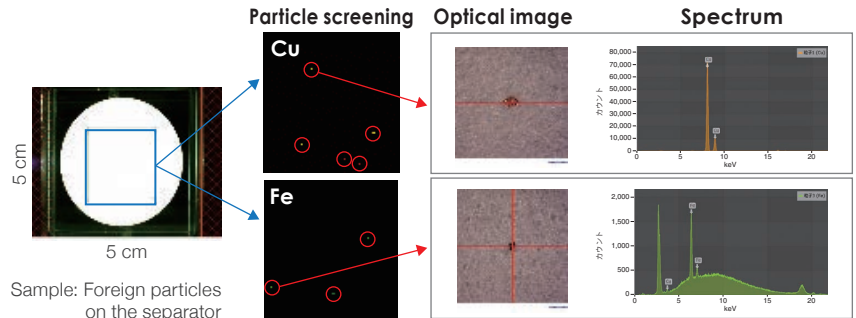


## The XGT-9000 Series: Wide range of applications

### Lithium-ion battery: Foreign particle analysis

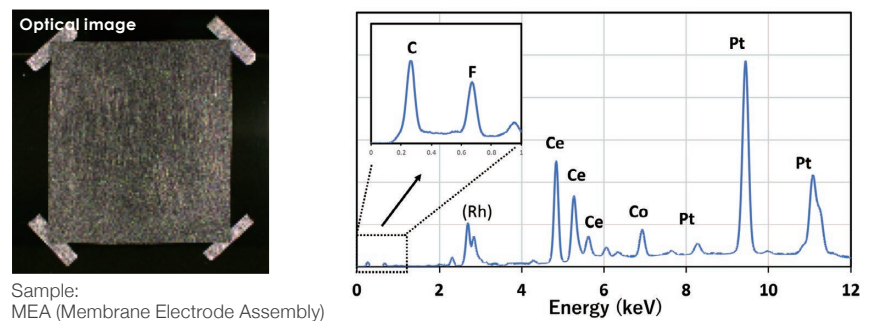
The XGT-9000 Series can detect and determine the composition of foreign particles, and therefore track the source of contamination.

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.



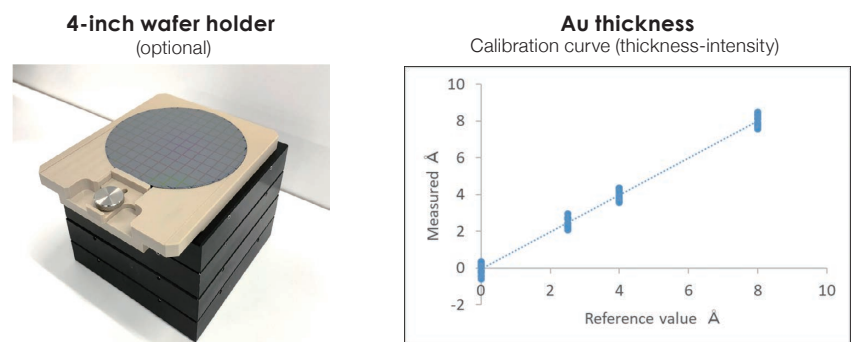
### Fuel cell: Catalyst loading mass and radical quencher imaging

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.



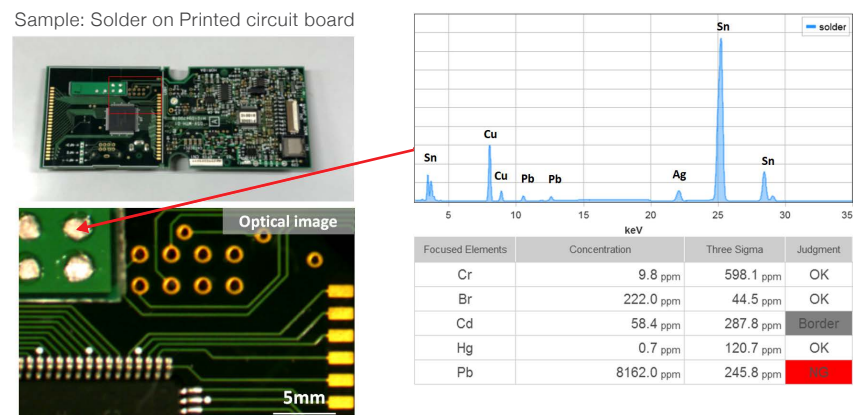
### Semiconductor: Coating thickness measurement

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

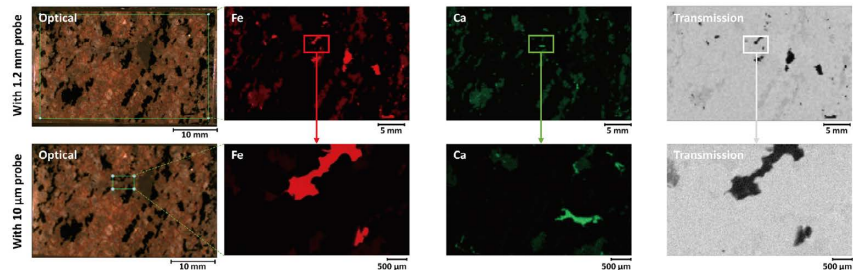
Simultaneous imaging of transmission X-rays and fluorescent X-rays is effective to find defects inside electronic components (see page 3). The XGT-9000 Series is also an effective screening tool for RoHS testing. It can perform elemental mapping to find suspicious components on a complex sample and analyze 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)

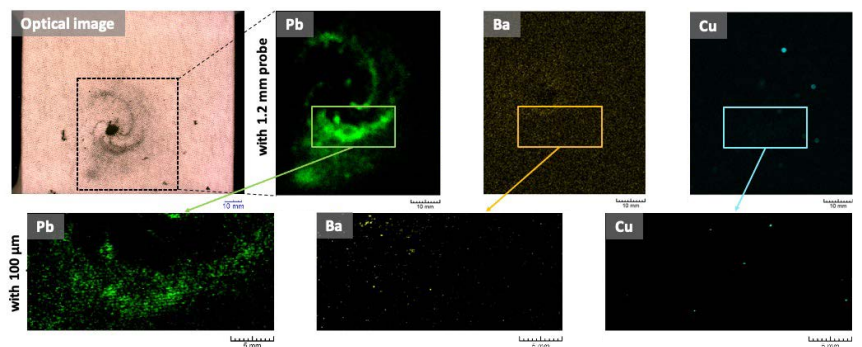
Sample: Thin section of a stone



## 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.



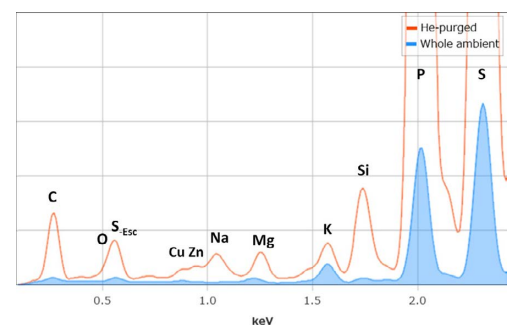
## Biology: Metabolism investigation

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.

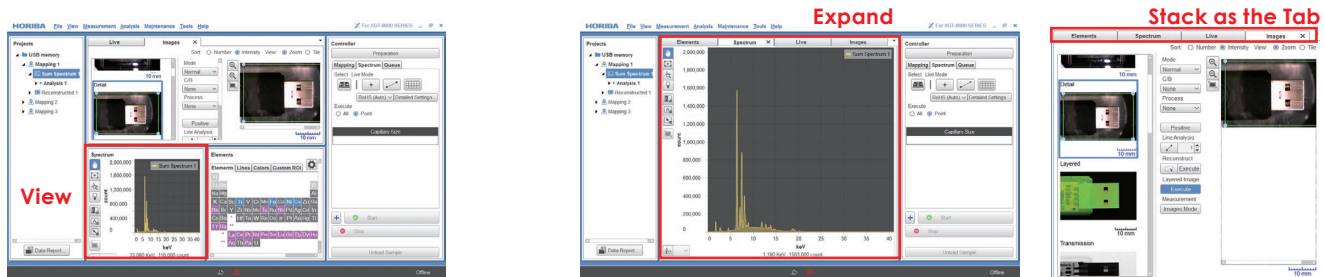


Sample: Dragonfly eye bead

## The XGT-9000 Series Software Suite

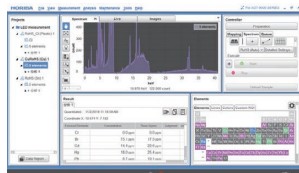
### Simple and rich GUI/Customizable windows/Advanced functions

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").

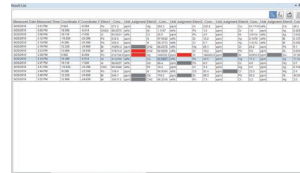


Standard GUI

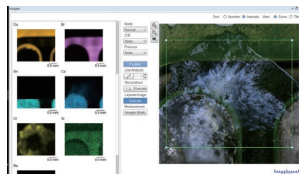
Edited GUI



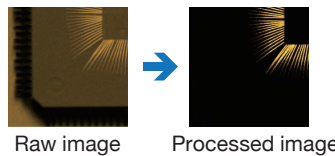
RoHS mode GUI



Result list view



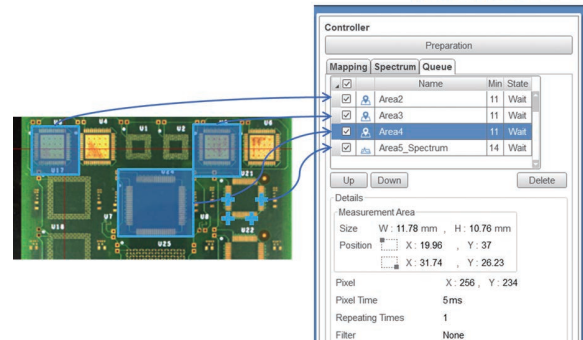
Floating view



Raw image

Processed image

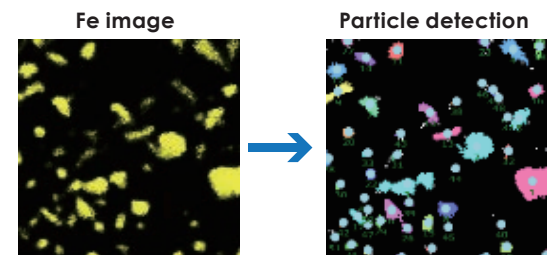
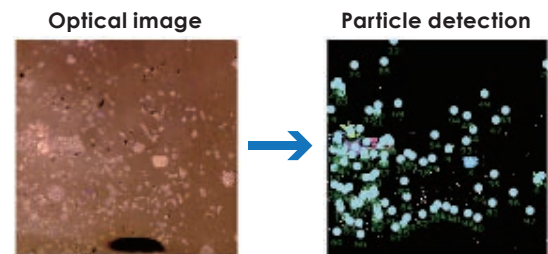
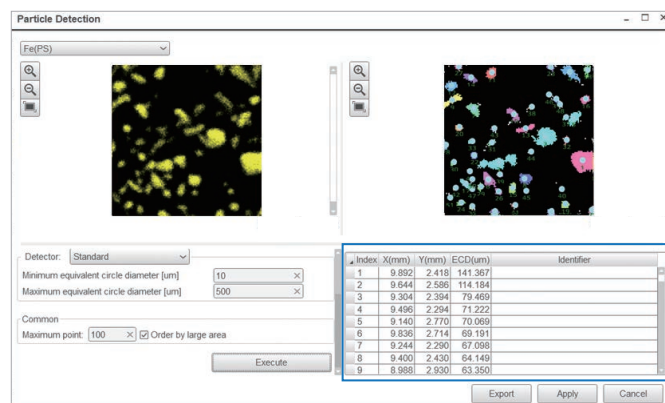
Image processing for mapping



Multiple measurements including mapping /multi points  
Queue function

### 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.

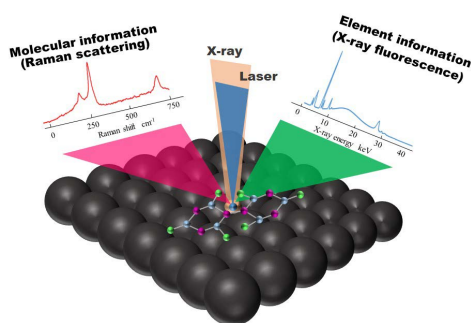


Coordinates of detected particles are automatically stored and transferred to the multi-point analysis mode.

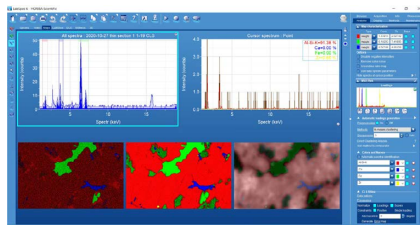
# Do more with your HORIBA XRF

## Combination of XRF and Raman Spectroscopies

- ◆ XRF and Raman spectroscopies are complementary techniques.
- ◆ XRF provides information about elemental composition of the material, whereas Raman offers molecular information.
- ◆ Co-localized measurements between the XGT-9000 Series and HORIBA Raman Spectroscopy provide more information about a sample.
- ◆ Transfer of XGT-9000 Series data to the advanced LabSpec Suite software using LabSpec Link.



Combination of XRF



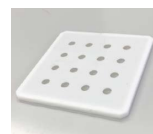
LabSpec Link

## Sample holders

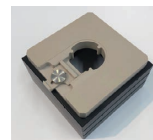
Various sample holders are provided to fit different shapes and types of samples. Fast and easy change between holders with HORIBA's modular stage design.



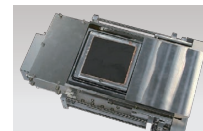
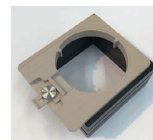
One touch sample holder



Sample tray (WR type)



Wafer holder (2-inch, 4-inch and others)



Transfer vessel  
Measurement of samples isolated from air

# HORIBA XRF family

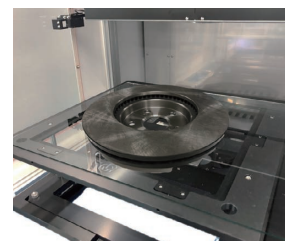
## XGT-9000SL Series



\*1 with the door closed

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\*2



MESA-50K



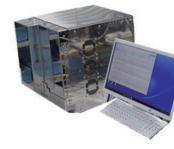
MESA-7220V2



SLFA-60



SLFA-6000 Series\*2



Real time analyzers for coating thickness or composition

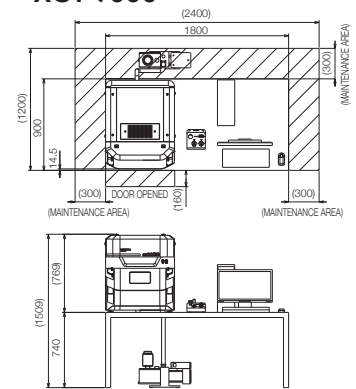


\*2 These products are available in all the regions except the EU and the UK.

# XGT-9000 Series Specification

## Dimensions (Unit: mm)

Model	XGT-9000		
	XGT-9000 Pro	XGT-9000 C	XGT-9000 Expert
<b>Basic information</b>			
Instrument	X-ray analytical microscope		
Principle	Energy dispersive X-ray fluorescence spectroscopy		
Detectable elements*	F (9) - Am (95)	C (6) - Am (95)	B (5) - Am (95)
Available chamber size	450 mm (W) x 500 mm (D) x 80 mm (H)		
Maximum mass of sample	1 kg		
Maximum mapping area	100 mm x 100 mm on 300 mm (W) x 250 mm (D)		
<b>Sample observation</b>			
Optical image observation	Two high resolution cameras		
Whole image	5 million pixels, Field of view: 100 mm x 100 mm		
Detailed image	5 million pixels, Field of view: 2.5 mm x 2.5 mm		
Optical design	Vertical-coaxial X-ray and optical observation		
Sample illumination / Observation	Top, bottom, side illuminations / Bright and dark fields		
<b>X-ray generator</b>			
Power	Up to 50 W		
Voltage	Up to 50 kV		
Current	Up to 1 mA		
Target material	Rh		
<b>X-ray guide tube (Probe)</b>			
Probe spot size selection	Various probe combination can be offered (e.g. 15 µm ultra-high intensity probe and 100 µm ultra-high intensity probe can be chosen)		
<b>Detectors</b>			
X-ray fluorescence detector	Liquid nitrogen-free Silicon Drift Detector (SDD)		
Transmission detector	NaI (TI)		
<b>Operating mode</b>			
Measurement environment	Whole vacuum	Whole vacuum	Whole vacuum
	Partial vacuum	Partial vacuum	Partial vacuum
	Whole ambient He purge (optional)	Whole ambient He purge (optional)	Whole ambient Partial vacuum He purge (optional)
<b>Instrument dimension (main unit)</b>			
Instrument size	680 mm (W) x 860 mm (D) x 760 mm (H)		
Mass weight	Approximately 200 kg		



\*Under whole vacuum condition



The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System ISO45001. We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.



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

- The specifications, appearance or other aspects of products in this catalog are subject to change without notice.
- Please contact us with enquiries concerning further details on the products in this catalog.
- The color of the actual products may differ from the color pictured in this catalog due to printing limitations.
- It 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/>

### HORIBA, Ltd. Japan

**Head Office**  
2 Miyahogashi-cho, Kisshoin, Minami-ku, Kyoto, 601-8510, Japan  
Phone: 81 (75) 313-8121 Fax: 81 (75) 321-5725

### Tokyo Sales Office

2-6, KandaAwaji-cho, Chiyoda-ku, Tokyo, 101-0063, Japan  
Phone: 81 (3) 6206-4721 Fax: 81 (3) 6206-4730

### HORIBA Taiwan, Inc. Taiwan

8F.-8, No.38, Taiyuan St. Zhubei City, Hsinchu County 30265, Taiwan (R.O.C.)  
Phone: 886 (3) 560-0606 Fax: 886 (3) 560-0550

### HORIBA INSTRUMENTS (SHANGHAI) CO., LTD China

No.99, Chunxiu Rd, Anting Town, Jiading District, Shanghai, China 201804  
Phone: 86 (21) 6952-2835 FAX: 86 (21) 6952-2823

### HORIBA (China) Trading Co., Ltd. China

Unit D, 1F, Building A, Synnex International Park, 1068 West Tianshan Road, 200335, Shanghai, China  
Phone: 86 (21) 6289-6060 Fax: 86 (21) 6289-5553

### Beijing Branch

12F, Metropolis Tower, No.2, Haidian Dong 3 Street, Beijing, 100080, China  
Phone: 86 (10) 8567-9966 Fax: 86 (10) 8567-9066

### HORIBA Instruments (Singapore) Pte Ltd. Singapore

3 Changi Business Park Vista #01-01, Singapore 486051  
Phone: 65 (6) 745-8300 Fax: 65 (6) 745-8155

### HORIBA Vietnam Company Limited Vietnam

Lot 3 and 4, 16 Floor, Detech Tower II, No.107 Nguyen Phong Sac Street, Dich Vong Hau Ward, Cau Giay District, Hanoi, Vietnam  
Phone: 84 (24) 3795-8552 Fax: 84 (24) 3795-8553

### PT HORIBA Indonesia Indonesia

Jl. Jalur Sutra Blok 20A, No.16-17, Kel. Kunciran, Kec. Pinang Tangerang-15144, Indonesia  
Phone: 62 (21) 3044-8525 Fax: 62 (21) 3044-8521

### HORIBA KOREA Ltd. Korea

25, 94-Gil, Iljik-Ro, Manan-Gu, Anyang-Si, Gyeonggi-Do, 13901, Korea  
Phone: 82 (31) 296-7911 Fax: 82 (31) 296-7913

### HORIBA India Private Limited India

246, Okhla Industrial Estate, Phase 3 New Delhi-110020, India  
Phone: 91 (11) 4646-5000 Fax: 91 (11) 4646-5020

### Technical Center

D-255, Chakan MIDC Phase-II, Bhamboli Village, Pune-410501, India  
Phone: 91 (21) 3567-6000

### HORIBA Instruments Incorporated USA

9755 Research Drive, Irvine, CA 92618, U.S.A.  
Phone: 1 (949) 250-4811 Fax: 1 (949) 250-0924

### Ann Arbor Office

5900 Hines Drive, Ann Arbor, MI 48108, U.S.A.  
Phone: 1 (734) 213-6555 Fax: 1 (734) 213-6525

### Sunnyvale Office

430 Indio Way, Sunnyvale CA94085, U.S.A.  
Phone: 1 (408) 730-4772 Fax: 1 (408) 730-8975

### HORIBA New Jersey Optical Spectroscopy Center

20 Knightsbridge Rd, Piscataway, NJ 08854, U.S.A.  
Phone: 1 (732) 494-8660 Fax: 1 (732) 549-5125

### HORIBA UK Limited UK

Kyoto Close Moulton Park Northampton NN3 6FL UK  
Phone: 44 (0) 1604 542500 Fax: 44 (0) 1604 542699

### HORIBA (Austria) GmbH Austria

Kaplanstrasse 5, A-3430 Tulln, Austria  
Phone: 43 (2272) 65225 Fax: 43 (2272) 65225-45

### HORIBA FRANCE SAS France

14 Boulevard Thomas Gobert - Passage Jobin Yvon CS 45002-91120 Palaiseau - France  
Phone: 33 (1) 69-74-72-00 Fax: 33 (1) 69-31-32-20

### HORIBA ABX SAS France

Parc Euromédecine, rue du Caducée, BP7290, 34184 Montpellier Cedex 4, France  
Phone: 33 (0) 4-67-14-15-16 Fax: 33 (0) 4-67-14-15-17

### HORIBA Europe GmbH Germany

Hans-Mess-Str.6, D-61440 Oberursel, Germany  
Phone: 49 (6172) 1396-0 Fax: 49 (6172) 1373-85

### Leichlingen Office

Julius-kronenberg-Str.9, D-42799 Leichlingen, Germany  
Phone: 49 (2175) 8978-0 Fax: 49 (2175) 8978-50

### HORIBA Europe GmbH Sweden

### Sweden Branch (Sodertalje)

Sydhamnsvagen 55-57, SE-15138, Sodertalje, Sweden  
Phone: 46 (8) 550-80701 Fax: 46 (8) 550-80567

### HORIBA ITALIA SRI Italy

### Torino Office

Via Ferroggio, 30, 10151 Torino, Italy  
Phone: 39 (11) 904-0601 Fax: 39 (11) 900-0448

### HORIBA Czech Prague Office Czech

Prumyslova 1306 / 7, CZ-10200, Praha 10, Czech Republic  
Phone: 420 (2) 460-392-65

### HORIBA OOO Russia

Altufievskoe shosse, 13, building 5, 127106, Moscow, Russia  
Phone: 7 (495) 221-87-71 Fax: 7 (495) 221-87-68