

X-ray Particle Contaminant Analyzer EA8000A



EA8000A enables rapid detection and elemental identification of metal particles approximately 20 μm in diameter found in the electrode plates of fuel cells and lithium ion rechargeable batteries.

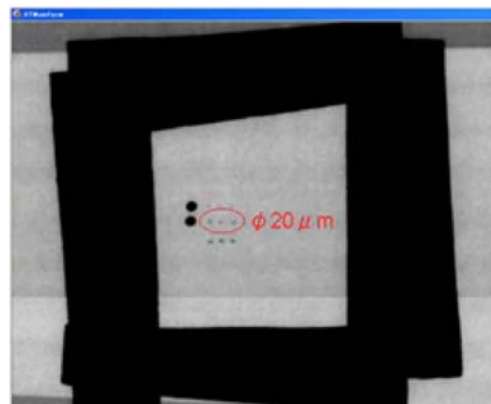
Metal particle contamination in electrode materials, separators of fuel cells, and lithium ion rechargeable batteries causes heat and fire and decreases battery capacity and lifetime. When the measurement parameters are set, the EA8000A automatically captures X-ray images, detects, and identifies metal particles, enhancing the efficiency of failure analysis and testing.

Features

20 μm Particles Detected in Samples 250 x 200 mm in Just a Few Minutes

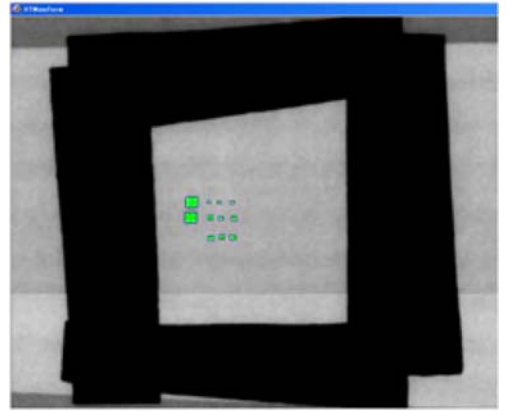
Conventional X-ray CT systems require about 10 hours to detect metal particles 20 μm in diameter in battery electrode plates 250 \times 200 mm (about B4-size).

Hitachi High-Tech Science developed a new particle inspection technology, in combination with the X-ray transmission method, resulting in greatly reduced imaging time. Detection time can be reduced to 3 to 10 minutes, more than 100 times shorter than conventional times.



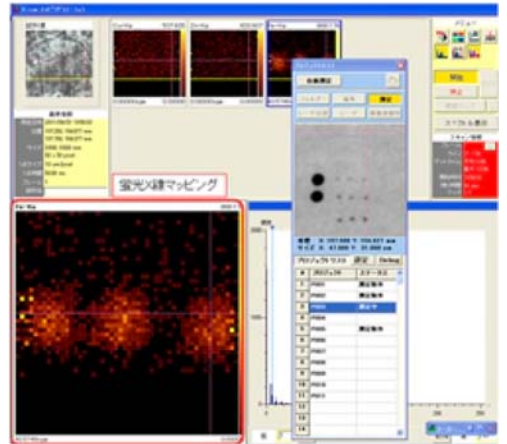
Automatic Particle Detection by Image Processing

EA8000A conducts high-speed image processing and detects particle position automatically over the entire 250 mm \times 200 mm area using X-Ray image capture.



Automatic Elemental Identification of the Detected Particle

Fluorescent X-ray mapping at the particle location and automatic elemental identification can be performed.

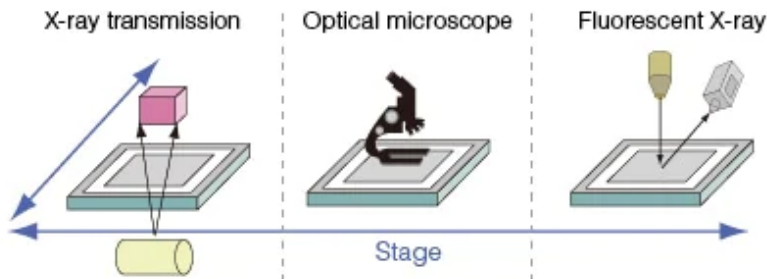


Identification of Metal Particles in Battery Electrode plates

Conventional instruments are only able to identify metal particles 20 um in diameter when the particles are on the surface of the electrode plates. Signals from embedded metal particles are very small due to the absorption by the surrounding sample material. The EA8000A uses unique, focused X-ray optics to identify the elements in metal particles deeper within electrode plates and organic films.

All-in-one Instrument for Higher Efficiency

Detection speed and metal contaminants identification can be done with much shorter time than conventional instruments. An X-ray imaging unit, fluorescent X-ray analyzer, and optical microscope are integrated into one system and linked to provide results automatically. The operator can simply place a sample and make measurements, resulting in efficient work and high throughput.



Specifications

Particle Size	Down to 20 μm
Detection Time	Approximately 3 to 10 minutes(imaging 250 \times 200 mm)
Elemental Analysis Time	Approximately 1 to 4 minutes per detection (subject to change depending on element and particle size)
Elements	Atomic nos. 12 (Mg) to 92 (U)
Sample State	Solid / Powder
Maximum Sample Size	250(W) x 200(D) x 0 to 50(H) mm
X-ray Tube (XRF Analyzer)	Small Air-cooled X-ray tube Voltage: 45 kV Current: 900 μA
X-ray Angle (XRF Analyzer)	Bottom-up Irradiation
Beam Size (XRF Analyzer)	30 μm
Fluorescent X-ray Detector	Vortex® (SDD) *No liquid nitrogen required
X-ray Tube (X-ray transmission)	Water-cooled X-ray tube
Transmitted X-ray Detector	Area image sensor
Sample Observation	High resolution lens and CCD camera
Controller	Desktop and 19" TFT monitor
Automatic Particle Analysis	X-Ray Imaging, metal particle detection, and elemental identification can be performed automatically.
Particle Size Measurement	Detected particle size (projected area) can be measured automatically using X-Ray Image.
Data Process	Microsoft Excel, Microsoft Word
Safety Mechanism	Door interlock, Crash protection, Instrument self-diagnosis
Power requirements	AC200 V to 240 V \pm 10% Single Phase, 20 A

Options

Signal Tower

Cooling Water Circulation System

- * "Microsoft", "Excel" and "Word" are registered trademarks of Microsoft Corporation in the United States and other countries.
- * Vortex is a registered trademark of Hitachi High-Tech Science America, Inc. in the United States and a registered trademark of Hitachi High-Tech Science Corporation in Japan.

Application Note

Introducing the example of fluorescent X-ray analysis.

XRF Analyzers for compliance with RoHS & ELV

Descriptions

Describing the applications and principles of fluorescent X-ray analysis.

Environmental Directives and Related Products & Service

Science Ring

The trademark that represents our strong bond with the customer and shows our pledge to connect science and society to create new value.