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PRESS RELEASE

Rigaku Holdings Corporation

Rigaku launches ONYX 3200, a Metrology Instrument for Semiconductor Manufacturing

Enables complete metal inspection for all processes from chip wiring to advanced packaging on a single platform

Tokyo, Japan; Rigaku Corporation, a global solution partner in X-ray analytical systems and a group company of Rigaku Holdings Corporation (headquarters: Akishima, Tokyo; CEO: Jun Kawakami; hereinafter “Rigaku”) announced the launch of the ONYX 3200, a new semiconductor metrology system to measure film thickness, composition and bump*structures for wafer-level processes. The system is engineered to help manufacturers stabilize quality and increase yield in the metal-wiring formation (back-end-of-line (BEOL)) and packaging processes of semiconductor chips.

Due to accelerating demands for AI, high-performance computing, data centers, mobile devices, and other devices, chip wiring and interconnect structures have grown increasingly delicate and complex. As a result, the ability to accurately and non-destructively measure metal layers thinner than a human hair and bumps under 10 μm , especially in BEOL and packaging processes, has become critically important since reliability and uniformity directly influence final device performance.

The ONYX 3200 meets these requirements and offers another significant advantage: it enables measurement of complex metal layers in bumps, previously requiring multiple instruments, using a single platform.

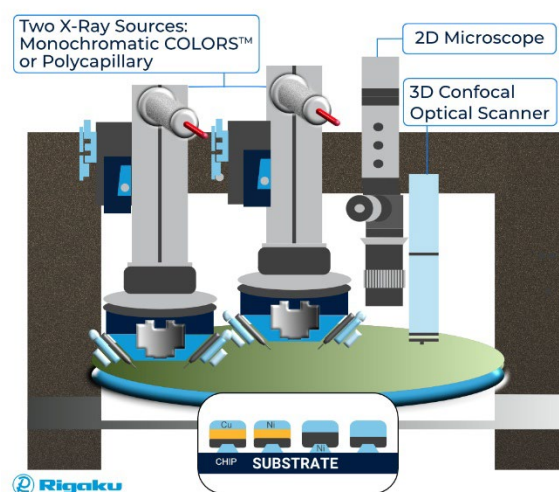
* Microscopic regions of raised metal used to connect between semiconductor chips and to circuit boards



Features of the ONYX 3200

- **High-precision bump metrology using a 3D confocal scanner**
The ONYX 3200 can inspect the shapes and heights of microscopic bumps and electroconductive metal patterns in 3D with high precision. Bumps consist of lower layers of copper, nickel, or similar materials beneath an upper layer of tin and silver. Conventional metrology methods result in absorption by the upper layer, making simultaneous measurement of upper and lower layers impossible. The ONYX 3200 integrates an optical scanner to capture the overall bump shape and total height and a fluorescent X-ray detector which is used to measure the upper metal layer thickness. Subtraction of these values enables precise calculation of the lower metal layers, establishing a baseline for ensuring robust interconnect reliability.
- **Original dual-head, microfocus X-ray source**
The ratio of materials in a tin-and-silver (SnAg) bump has significant impact on the reliability of packaging connections. Rigaku has developed a unique, dedicated X-ray head capable of detecting silver content as low as 2% within SnAg bumps with an exceptional precision of 4 parts per 100,000 providing rigorous materials ratio control for packaging yield. Moreover, the dual-head architecture enables simultaneous measurements of the wide range of metal features around chip interconnects, improving throughput and analytical flexibility.

ONYX 3200 | DUAL-HEAD MICRO-FOCUS X-RAY SOURCES



▲Dual-Head Micro-Focus X-ray Sources

■ Market Outlook

Rigaku has shipped an initial ONYX 3200 system to a major global foundry for deployment in an advanced packaging line and is currently receiving strong interest from leading semiconductor manufacturers worldwide. The company targets JPY 1.5 billion in ONYX 3200 sales in FY2026, with plans to double to JPY 3 billion in FY2027 as adoption expands across packaging and BEOL applications.

Product Details

<https://rigaku.com/ja/products/semiconductor-metrology/xrr-edxrf-and-optical-tools/onyx-3200>

About the Rigaku Group

Since its establishment in 1951, the engineering professionals of the Rigaku group have been dedicated to benefiting society with leading-edge technologies, notably including its core fields of X-ray and thermal analysis. With a market presence in 136 countries and regions and some 2,000 employees from 9 global operations, Rigaku is a solution partner in industry and research analysis institutes. Our overseas sales ratio has reached approximately 70% while sustaining an exceptionally high market share in Japan. Together with our customers, we continue to develop and grow. As applications expand from semiconductors, electronic materials, batteries, environment, resources, energy, life science to other high-tech fields, Rigaku realizes innovations “To Improve Our World by Powering New Perspectives.”

For details, please visit: rigaku-holdings.com/english

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